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**Craspidospermum Boj. ex A. DC., Gonioma E. Mey.,
Mascarenhasia A. DC., Petchia Livera, Plectaneaia Thou.,
and Stephanostegia Baill.**

by

A.J.M. Leeuwenberg

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Craspidospermum Boj. ex A. DC., **Gonioma** E. Mey.,
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and **Stephanostegia** Baill.

by A.J.M. Leeuwenberg

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Abstract

Six genera of Apocynaceae have been monographed. These six are restricted to Africa, except for *Petchia*, which also occurs in Sri Lanka with one endemic species. The study is based on herbarium material and living plants, mostly observed and collected by the author in Madagascar. *Petchia* replaces the well-known genus name of *Cabucala* as it has priority, so six new combinations have been made here. *Petchia africana* from Cameroun has been described as new to science. For *Carissa verticillata* a new name has been proposed to replace Pichon's homonym, *C. pichoniana*. In all, 23 names have been reduced to synonymy, 14 of which are even synonyms of *Plectaneia thouarsii*.

A key to all Apocynaceous genera indigenous to the Comoro Islands and Madagascar has been provided.

Petchia erythrocarpa is locally used as medicine. *Mascarenhasia lanceolata* and *M. lisianthiflora* are potentially of economic value as ornamentals.

Introduction

This publication is composed of monographic revisions of six genera, *Craspidospermum*, *Gonioma*, *Mascarenhasia*, *Petchia*, *Plectaneia* and *Stephanostegia*, three of which, the first and the last two are endemic to Madagascar and two are represented in that country and on the African continent as well. It is illustrated with photographs, line drawings and distribution maps.

These revisions are mainly based on study of herbarium material, while the author had the opportunity to observe living plants, and to collect material of the monotypic *Craspidospermum*, of three of the eight species of *Mascarenhasia*, four of the eight *Petchia* species, of all three *Plectaneia* species, and of *Stephanostegia capuronii* in the wild and *Gonioma kamassi* in cultivation.

Several species, *Mascarenhasia arborescens*, *Petchia erythrocarpa*, *P. madagascariensis* and *Plectaneia thouarsii* turned out to be more variable than was supposed by Markgraf (1976). The present author had the opportunity to study living plants in the field in many different localities and to observe the variation within individual plants and within populations. All these species are widespread and the ecology of their habitats is greatly varied. He therefore was obliged to reduce many names to synonyms.

It has been possible to trace almost all type specimens of the names and synonyms discussed in the present paper.

Geographical Distribution

Craspidospermum verticillatum, the only species assigned to this genus, is a forest tree which produces highly appreciated timber and is called Vandrika all over the country of origin, Madagascar. As its populations in the wild are vigorously damaged by harvesting, it should be taken into cultivation for timber purposes.

Gonioma counts two species, one belongs to the Cape flora and one occurs in southwestern Madagascar.

Mascarenhasia has one species, that is very common in Madagascar, and also occurs in East Africa from Kenya south to Mozambique. All other 7 species of *Mascarenhasia* are endemic to Madagascar. *M. lisianthiflora* is widespread and common in dry areas. *M. lanceolata* is only known from the northwest and *M. speciosa* from the southeast, while the four remaining species, which are much more rarely represented in herbarium collections, are all from eastern areas. *M. havetii* and *M. macrosiphon* have recently been collected. *M. rubra*, only known from the type, and *M. tampinensis*, only known from a few rather old collections of two localities, even may already be extinct.

The genus *Petchia* is represented by a single endemic species in Sri Lanka, six endemic species in Madagascar and one species known from only two specimens collected in the same forest in Cameroun. The last species, *P. africana*, described in this paper as new to

science, has been discovered among the unnamed material in the Wageningen herbarium, where it was present for several decades. It is perfectly understandable, that it could have been recognized only with the revisions of all African Apocynaceae. The revisions of the last yet unpublished genera of this family for Africa have been started, and therefore its identity as a new discovery for the African continental flora could be established.

The most widespread species of *Petchia* is *P. erythrocarpa*, which is represented on the Comoro Islands and distributed almost over entire Madagascar. It only does not occur in the southwest. *P. madagascariensis* is the second most widespread species. It occurs in northern and eastern Madagascar. *P. cryptophlebia* is central-eastern of distribution. *P. montana* is rare and has been collected in forest remainders on the central plateau. *P. plectaneifolia* is only known from a few collections in the southeast. Finally *P. humbertii* inhabits only one locality in the north, as far as is known.

Plectaneia, is endemic to Madagascar, and has one widespread variable species, *P. thouarsii*, which must have a great ability to adapt to various ecological conditions. It occurs over almost the entire country. The second species, *P. stenophylla*, inhabits dry places in the southwest. The third and last species, *P. longisepala* is only known from two collections made in the coastal forest in the east.

The two species of *Stephanostegia* share Madagascar almost evenly. *S. capuronii* inhabits the wet eastern forests and *S. hildebrandtii* the dry west. At least the first suffers from being exploited like *Craspidospermum*. Its wood is also esteemed as timber.

Relation to other genera

Petchia belongs to the tribe Alyxieae of the subfamily of the Plumerioideae, where it is housed at present in the subtribe Rauvolfiinae. It shows remarkable resemblances to the Asian, Oceanic and Australian genus *Alyxia* by the moniliform fleshy follicles which contain drupes, by the frequently whorled leaves, and to a lesser extent by the flowers with an almost cylindrical corolla tube usually longer than the lobes. It could be segregated from *Alyxia*, as the seeds lack the rumination in the endosperm. Due to the latter character it has been moved within the Alyxieae from the Alyxiinae to the Rauvolfiinae. The present author, who had the opportunity to see most of the Madagascan species of *Petchia* and a

few of *Alyxia* in the wild, corroborates this approach. He saw the Prévost model in the *Petchia* shrubs and trees, while the *Alyxia* climbers, quite probably grow in the model of Troll.

The four genera *Craspidospermum*, *Gonioma*, *Plectaneia* and *Stephanostegia* constitute together with the Asia genera *Dyera* and *Kamettia*, and the American genus *Strempeliopsis*, the subtribe Craspidospermatinae of the tribe Plumerieae of the subfamily Plumerioideae. Their capsular fruits contain flat winged seeds with thin non-ruminate endosperm. The corolla tube is cylindrical or nearly so and the lobes overlap to the left. The stamens are included. The wings of the seeds vary in shape, but are mostly more or less entire, only in *Craspidospermum* they are more or less fimbriate giving the dark brown seeds some resemblance to miniature fried plaice.

Mascarenhasia belongs to the subtribe Malouetiinae of the tribe Wrightieae of the subfamily Apocynoideae, in the context of the subdivision of the subfamily that has been kept up to the present day. The dry follicles, seeds with coma and the corolla lobes overlapping to the right are all characters known from almost all Apocynoideae. As the subdivision of the Apocynoideae may be altered considerably, when more monographs of the genera will be completed, not much more can be said on the latter subject now (see also Leeuwenberg, 1994). Nevertheless, *Mascarenhasia* is closely allied to the Asian genus *Kibatalia* by almost all characters, e.g. model of Koriba, the shape of the corolla, the dry follicles, the seeds with coma and the corolla lobes overlapping to the right. *Kibatalia*, however, differs clearly from *Mascarenhasia* by the seeds which are beaked with the coma recurved instead of erect, and with the apex directed towards the base of the follicle instead of towards the apex. The seeds of *Kibatalia* strikingly resemble those of *Strophanthus*.

Key to the genera of Apocynaceae indigenous to the Comoro Islands and to Madagascar

1. Herbs; corolla usually pink and with a very narrow long tube and a wide flat limb.....**Catharanthus**
- Plants woody.....2
2. Leaves alternate, often confined to the apices of the branchlets.....3
-3

Leaves opposite or whorled.....	4
3. Plants succulent and with spines and clear sap.....	Pachypodium
Plants not succulent, unarmed, with white latex.....	Cerbera
4. Plants with spines, often in low numbers and short; corolla white; berries small, mostly globose.....	Carissa
Plants unarmed.....	5
5. Climbers.....	6
Trees or shrubs.....	11
6. Tendrils present; stems not twining; corolla lobes overlapping to the left; fruits baccate.....	7
Tendrils absent; stems usually twining; corolla lobes overlapping to the left or to the right; fruits capsular, of 2 linear follicles..	9
7. Inflorescence of elongate branched terminal panicles, longer than the leaves; fruits pubescent.....	Ancylobotrys
Inflorescence contracted and shorter than the leaves; fruits glabrous.....	8
8. Wall of corolla tube not thickened above anthers; inflorescence terminal; corolla tube 16--34 mm long.....	Saba
Wall of corolla tube thickened above anthers; inflorescence terminal and/or axillary; corolla tube usually less than 15 mm long.....	Landolphia
9. Petiole glandular above; leaves mostly with domatia; corolla lobes overlapping to the right; 5 corona lobes; seeds with coma	Oncinotis
Petiole not glandular above; leaves without domatia; corolla lobes overlapping to the left or to the right; corona absent.....	10
10. Ocrea widened into clear intrapetiolar stipules (90° turned as to compare with the interpetiolar stipules of Rubiaceae); corolla lobes overlapping to the left; seeds with wings; follicles syncar- pous, often angular and winged.....	Plectaneia
Ocrea not widened into clear intrapetiolar stipules; corolla lobes overlapping to the right; seeds with coma; follicles apocarpous, terete	Alafia

- 11(5). Leaves whorled, at least at apices of branchlets.....12
 All leaves opposite.....16
12. Corolla lobes much shorter than the tube; stamens inserted in upper half of tube; fruits drupaceous, with fleshy mesocarp, apocarpous or almost so, or syncarpous globose berries.....13
 Corolla lobes about as long as the tube; stamens inserted in lower half of tube; fruits capsular, bivalved, syncarpous.....
**Craspidospermum**
13. Only upper leaves of each branchlet and of main axis verticillate, the other opposite; fruits apocarpous, mericarps moniliform; disk absent; plants growing in the model of Prévost....**Petchia**
 All leaves verticillate, or only those on main axis verticillate and those on lateral branches opposite; plants model of Prévost in some *Carissa* species.....14
14. All leaves verticillate.....15
 Leaves on main axis verticillate and those on lateral branches opposite16
15. Corolla lobes overlapping to the right; fruits small globose berries, leaves up to 4 cm long.....**Carissa pichoniana**
 Corolla lobes overlapping to the left; fruits halfway syncarpous and obcordate, or apocarpous and mericarps ellipsoid; most leaves more than 5 cm long.....**Rauvolfia**
16. Plants repeatedly dichotomously branched; fruits of paired, often fleshy, non-moniliform follicles.....17
 Plants not dichotomously branched; fruits paired, dry follicles, or moniliform and then fleshy follicles, or globose berries....20
17. Corolla lobes overlapping to the right; follicles dry.....18
 Corolla lobes overlapping to the left; follicles fleshy; seeds without coma; corolla white or yellow.....19
18. Follicles linear; seeds with coma; pedicels (7—)12—35 mm long; corolla orange. Madagascar.....**Strophanthus**
 Follicles ellipsoid; seeds without coma; pedicels 2—3 mm long; corolla yellow or creamy. Comoro Islands.....**Schizozygia**

19. Corolla tube about as long as the sepals; calyx shed with corolla; leaves rounded at apex; mericarps dark green, pale green-spotted and -dotted.....**Voacanga**
Corolla tube mostly at least twice as long as sepals; calyx persistent when corolla is shed, often even present under the fruit; leaves mostly acuminate or acute.....**Tabernaemontana**
20. Corolla lobes overlapping to the right; tube mostly more than 5 mm long, seeds with coma or not, not winged21
Corolla lobes overlapping to the left, tube up to 4 mm long; seeds winged.....22
21. Corolla tube funnel-shaped or with a cylindrical basal part that abruptly widens into an upper part; follicles dry; seeds with coma**Mascarenhasia**
Corolla tube cylindrical; berries globose; seeds without coma.....**Carissa**
22. Corolla tube about 2.5 x as long as the lobes, without slits. Dry forest in South Madagascar.....**Gonioma**
Corolla tube slightly longer than the lobes, with 5 longitudinal slits. Mostly wet forest in the East and the Northwest of Madagascar; often big trees (fragments found on the forest floor could be confused with those of *Plectaneia* which has intrapetiolar stipules not present here).....**Stephanostegia**

1. Craspidospermum Boj. ex A. DC., Prod. 8: 323 (1844); Markgraf, Fl. Mad. fam. 169: 97 (1976). — Type species: *C. verticillatum* Boj. ex A. DC.

1. 1. Craspidospermum verticillatum Boj. ex A. DC., Prod. 8: 323 (1844); Markgraf, Fl. Mad. fam. 169: 97, pl. 13, map 21 (1976). — Type: Madagascar, Antananarivo, near Antananarivo and Imamou, Bojer anno 1839 (holotype G-DC; isotypes BM, K, P).

Fig. 1, p. 12; map 1, p. 13

Heterotypic synonyms: *C. verticillatum* var. *petiolare* A. DC., op. cit. 324, **syn. nov.** — Type: Madagascar, sin. loc., collector unknown, possibly Commerson, "*Ochrosia*" (holotype G-DC; possible isotype Commerson 791, MA).

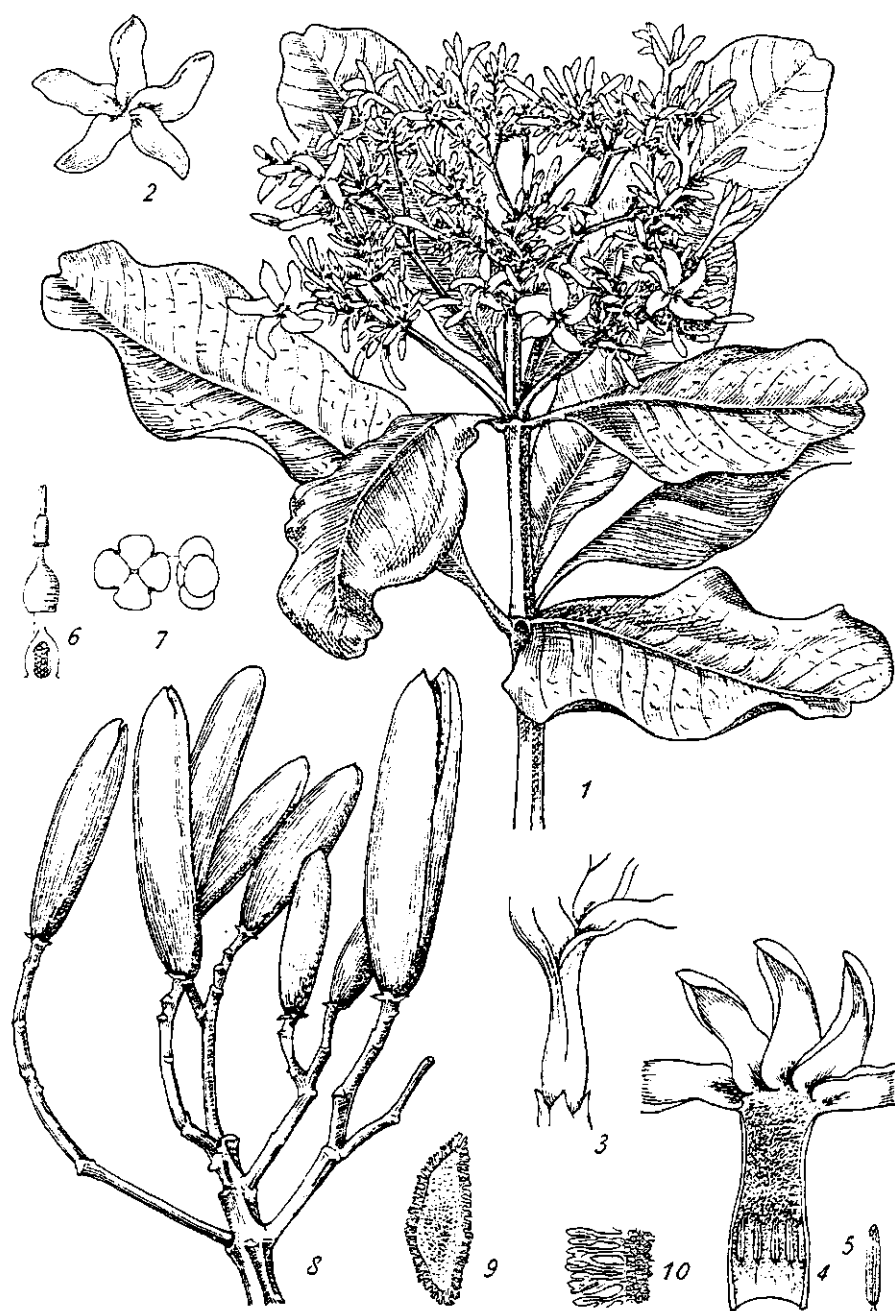
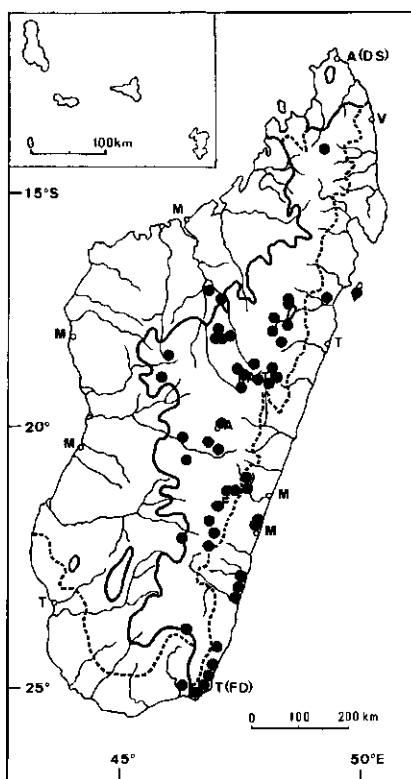


Fig. 1. *Craspidospermum verticillatum*. 1, habit (x 2/3); 2, flower above (x 2); 3, central part of flower (x 3); 4, opened corolla (x 5); 5, stamen (x 10); 6, pistil with longitudinal section of ovary (x 10); 7, tetrads of pollen grains much enlarged; 8, infructescence (x 2/3); 9, seed (x 2); 10, part of seed edge much enlarged.



Map 1.
Craspidospermum verticillatum.

C. verticillatum var. *sessile* Markgr. in *Adansonia* II, 12: 219 (1972); op. cit. 102, map 21, **syn. nov.** — Type: Madagascar, Toliara, Manampanihy R. valley, near Ampasimena, *Humbert* 20575 (holotype P).

Tree 3–25 m high, glabrous except for the corolla inside, with white latex at least in branchlets, not in bark of trees. Trunk up to 50 cm in diameter; bark pale grey-brown, rather smooth. Branches lenticellate; branchlets triangular or quadrangular at the apex, often even when dried. *Leaves* in whorls of 3–4, petiolate, rarely sessile; petiole 5–25 mm long; blade coriaceous even when fresh, narrowly elliptic or obovate, 1.3–3 x as long as wide, 4–14 x 2–6.5 cm, rounded or sometimes apiculate or acute at the apex, cuneate at the base, with 10–20 pairs of rather straight secondary veins forming an angle of 60–80° with the costa; tertiary venation reticulate, conspicuous beneath. *Inflorescence* terminal and in the axils of the upper leaves, 1–4 together, with very many flowers, 4–12 x 4–10 cm, dense. Peduncle 10–85 mm long;

pedicels 0.5—3 mm long. Lower bracts leafy, other sepal-like and 1—2 x as long as the sepals. *Flowers*: *Sepals* green, connate at the base, subequal, clasping the base of the corolla or in dried flowers often somewhat spreading, ovate or broadly ovate, obtuse or rounded, without colleters. *Corolla* white or pale pink, or limb white, throat pink or dark red and tube often pink, with an ellipsoid head in the mature bud about half of the bud length, pilose inside from the mouth to the insertion of the stamens and with a pubescent belt below the insertion of the stamens 1—2 mm wide with straight hairs directed downwards, not ciliate on lobes; tube cylindrical, 3.8—5.3 x as long as the calyx, 0.9—2.4 x as long as the lobes, 6—10 mm long, 0.9—1.2 mm wide at the base, widened around the anthers to 1.2—2.5 mm wide, narrowed above to 1—2 mm wide, again widened at the throat; lobes narrowly elliptic, 0.4—1.1 x as long as the tube, 2.1—3.5 x as long as wide, 2.5—9 x 1.5—3.5 mm, rounded, entire, suberect to spreading, overlapping to the left. *Stamens* deeply included, inserted 1.5—4 mm from the base of the corolla tube; filaments 0.3—1 mm long; anthers very narrowly ovate to oblong, 4—5.5 x as long as wide, 1.1—1.5 x 0.2—0.3 mm, apiculate to obtuse at the apex, cordate at the base, entirely fertile. *Pistil* with apex near base of anthers; ovary subglobose or nearly so, 0.5—1 x 0.5—0.8 x 0.5—0.7 mm, 2-celled, rather abruptly narrowed into the short style; pistil head of a basal stigmatic ellipsoid part 0.6—0.8 x 0.3—0.4 mm and an oblong bilobed stigmatic apex. Ovules approximately 30 in each cell. *Fruit* an oblong woody capsule 2.5—6 x 1—1.8 cm, rounded at the apex and at the base, bivalved, septicidal; wall about 2 mm thick. *Seed* dark brown, flat obliquely elliptic, 12 x 4 x 2 mm, resembling a fried plaice, ciliate with irregularly coherent hairs like fins 1—1.5 mm long, minutely papillose; endosperm mealy; embryo straight, spatulate, 8 mm long; cotyledons ovate 3 x 2 mm, rounded at the apex and at the base; rootlet 5 x 1 mm.

Distribution: Endemic to Madagascar.

Ecology: Rain forest. Alt. 0—1800 m.

Uses: Wood used as timber.

Geographical selection of the approximately 140 specimens examined:

Madagascar. Mahajanga: Tsiafankantiha, Maevatanana, SF 12546 (K, P, TEF); near Andriba, *McPherson* 16433 (TAN). Antsiranana: Analamohitso Forest, upper Bemarivo R., *Perrier de la Bâthie* 8841 (P). Antananarivo: Ankazobe Mts, km 161 Antananarivo-Mahajanga Road, *Capuron* SF 224 (P, TEF); Manankazo,

Harizo RN 1150 (BR, K, P, WAG); *ibid.*, Ambohitantely, SF 7881 (P, TEF); 27 km N of Ankazobe, *Miller & Phillipson* 3724 (BR, K, P, TAN, WAG); near Antananarivo, *Bojer* anno 1839 (BM, G-DC, K, P, type); *ibid.*, *Bouton* anno 1838 (G-DC); Ankazondandy, *Boiteau* 85 C (K, P); Angavokely, 30 km E of Antananarivo, *Capuron* SF 118 (P, TEF); Soalazaina Forest, Andilanatoby, *Cours* 1517 (P, TAN); Ambohimanga, *Leeuwenberg & Rapanarivo* 14644 (BR, P, TAN, WAG); *ibid.*, *Capuron* SF 18367 (K, P, TEF); ca 14 km NW of Ambohitsarotelobebao, NW of Tsiroamandidy, *Dorr et al.* 3490 (K, P, TAN, WAG); Bongolava, W of Tsiroamandidy, *Morat* 4609 (P, TAN), 4620 (P, TAN); near Ambavomanoina, E of Antananarivo, *Boiteau* 2132 bis (K, P); E slope of Iharanandriana, *Capuron* SF 27387 (BR, K, P, TEF); Sirabe (= Antsirabe), *Hildebrandt* 3602 (BM, BREM, K, P, W). Toamasina: Île Ste. Marie, *Capuron* SF 28818 bis (P); Antsaralalana, Manakambahiny Est, *Ramanantsoavina* RN 1775 (K, P, WAG); Imerimandroso, Ambatondrazaka District, *Rakotovo* RN 10863 (P); Ambatosoratra, *Rakotovo* RN 11027 (P); Manaka Est, *Ramanantsoavina* RN 2793 (P, TAN, WAG); Andranobe Forest, W of Manohilaly, *Capuron* SF 18778 (BR, K, P, TEF); Manakambahiny, *Ramanantsoavina* RN 1935 (P, TAN, WAG); Belamba, Andilanatoby, SF 5664 (BR, K, P, TEF); Fierenana, Moramanga, SF 117-R-187 (P); Sakala-Ambany, Marovoay, SF 25018 (K, P, TEF); Antsahatsaka, Beravina, SF 7545 (BR, K, P, TEF); Antaniditra, Perinet, SF 2914 (P, TAN, TEF); Analamazaotra, Perinet, SF 19018 (P, TEF); Mandraka Forest, km 75 Antananarivo-Tamatave Road, *Cremers* 1282 (BR, P, TAN); Amboasary, Beforona, SF 85-R-147 (P). Fianarantsoa: Mangatabotahangy, SF 7-R-207 (P); Vazampotsy Forest, Ambatofinandrahana, SF 37-R-10 (P); Ambalanimanakena, Ambositra, SF 5216 (P, TEF); Ampitambe, Fianarantsoa, SF 7056 (K, P, TEF); 9 km E of km 26 Fianarantsoa-Ambositra, on road to Ranomafana, *Leeuwenberg & Rapanarivo* 14642 (BR, P, TAN, WAG); Ranomafana Reserve, S of Namorona R., *Schatz & Miller* 2452 (BR, K, P, TAN, WAG); *ibid.*, *Malcomber et al.* 1347 (BR, P, WAG); *ibid.*, *Phillipson* 2215 (BR, K, P, TAN, WAG); Morafeno, Ifanadiana District, SF 26378 (= 87-R-73) (P); Ankafina, *Hildebrandt* 3936 (BM, K, P, US, W); Sihanaka, *Boiteau* in *Herb. Jard. Bot. Tana.* 2925 (P); W of Ambalavao, *Croat* 30302 (P, TAN, WAG); Ambatomainty, Mahatsinjony, SF 16146 (K, P, TEF); Mahazony, Ambalavao, *Rakotovo* RN 6830 (P); near Zazafotsy, *Croat* 30361 (TAN); Andringitra Reserve, *Henri* RN 4875 (P, TAN); *ibid.*, SF 21057 (P, TEF); Farafangana, SF 13955 (P, TEF); Manombo Forest, *Capuron* SF 9208 (BR, K, P, TEF), SF 16269 (K, P, TEF); Angavokely, Carion, SF 6639 (P, TEF). Toliara: Manampanihy R. valley, near Ampasimena, *Humbert* 20575 (P, type of *C. verticillatum* var. *sessile*); Vohimavo Mt, N of Ampasimena, *Humbert* 20679 (P); Manantenina, Fort-Dauphin, *Debray* 2016 (P, TAN); Fort-Dauphin, *Scott Elliot* 2378 (K); Mahatalaky, SF 12067 (K, P, TEF); Mt Enivabe, Ranopisa, SF 11170 (P, TEF); Ebakika, Fort-Dauphin, *Decary* 10996 (P); Andohahela Reserve, *Rakotoniana* RN 5947 (BR, K, P, WAG); *ibid.*, *Leandri & Saboureaux* 4304 (BR, K, P, WAG); Behara, *Tsilizy* RN 8356 (P, TAN); *ibid.*, SF 13922 (P, TEF); Ivakoany Mts, *Humbert* 7024 (P). Sin. loc.: Anonym. s.n. (G-DC, type of *C. verticillatum* var. *petiolare*); *Baron* 89 (K), 111 (FT), 768 (BM, K), 853 (FT, K, P); *Commerson* s.n. (MA, P).

Cultivated. Madagascar, Antananarivo, Tsimbazaza Park, *Dorr & Barnett* 3170 (K, P, TAN, WAG); of same tree, *Leeuwenberg* 13713 (WAG).

Note. The leaves have petioles that show a continuous range of variation in length. Exceptionally they are sessile as in the type of

var. *sessile*. As there are no characters to corroborate the distinction of the varieties, these are not maintained here.

2. **Gonioma** E. Mey., Comment. Pl. Afr. Austr. 188 (1837); Codd, Fl. S. Afr. 26: 262 (1963); Markgraf, Fl. Mad. fam. 169: 112 (1976). — Type species: *G. kamassi* E. Mey.

Shrubs or trees, glabrous except for corolla inside. Branches pale brown, lenticellate; branchlets terete. *Leaves* in whorls of 3—4 or opposite, petiolate; blade subcoriaceous when fresh, papery when dried, narrowly elliptic, acuminate to obtuse at the apex, cuneate at the base, margin revolute in dried leaves, venation obscure. *Inflorescence* terminal, many-flowered, dense. Lower bracts leafy, other very narrowly elliptic and long-acuminate to sepal-like. *Flowers*: *Sepals* connate at the base, subequal, ovate, obtuse or rounded, without colleters. *Corolla* white, yellow or orange, pilose inside from mouth to 1—2 mm below insertion of stamens, with a broadly ovoid rounded head in the mature bud about one third of the bud length; tube nearly cylindrical, widened around the anthers, mostly narrowed at the mouth; lobes overlapping to the left in bud, suborbicular or ovate, rounded, entire, spreading. *Stamens* with apex 0—1 mm below mouth of corolla tube; filaments very short; anthers ovate or narrowly so, acuminate to obtuse at the apex, cordate at the base, entirely fertile. *Pistil* with apex near base of anthers; disk absent; ovary subglobose or ovoid, mostly rather abruptly narrowed into the short style, of 2 separate carpels; pistil head of a basal ellipsoid stigmatic part and a bilobed stigmatic apex. *Fruit* of 2 separate follicles; follicles light brown, narrowly oblong, capsular, adaxially dehiscent, with a thick wall. *Seed* flat, winged.

Two species, one at the Cape and one in southwestern Madagascar.

Key to the species of *Gonioma*

1. Leaves obtuse or acute, rarely acuminate; sepals rounded or obtuse; corolla tube 5.5—7.5 mm long; lobes 2—3 x 2.5—3.5 mm; follicles narrowly ellipsoid, 2—6 x as long as wide. South Africa.....1. ***G. kamassi***
Leaves acuminate; sepals obtuse; corolla tube 4.5 mm long; lobes

ovate, 2 x 1 mm; follicles linear, 8—15 x as long as wide.
Madagascar.....2. **G. malagasy**

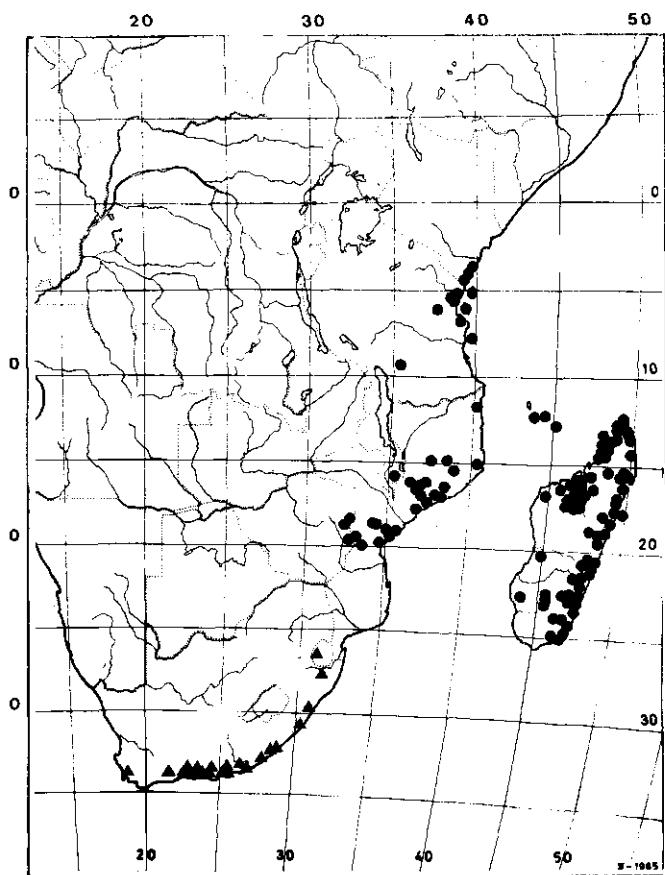
2. 1. Gonioma kamassi E. Mey., Comment. Pl. Afr. Austr. 189 (1837); Codd, Fl. S. Afr. 26: 262 (1963). — Types: South Africa, Eastern Cape, near Vanstaadesrivier, *Drège* a (lectotype P, designated here; isoelectotypes G, G-DC, HBG, K, L, P, S, TCD, W). Paratype: South Africa, Eastern Cape, near Meulrivier, *Drège* b (E, G, HBG, K, L, P, S, W).

Map 2, p. 18

Heterotypic synonyms: *Tabernaemontana camassi* Eckl in S.A. Quart. Journ 371 (1830), not cited by E. Meyer and therefore not accepted as basionym by Codd. — Type: South Africa, Eastern Cape, Uitenhage, Krakakamma For., *Ecklon* 3.10 (lectotype P, designated here; isoelectotypes BP, C, E, F, GH, HBG, L, NY, TCD, UPS, W, Z).

G. kamassi var. *brachycarpa* E. Mey., l.c. — Type: South Africa, Eastern Cape, Uitenhage Division, near Galgebosch, *Drège* s.n. (lectotype P, designated here; isoelectotypes E, G, G-DC, HBG, K, L, P, TCD, W).

Shrub or tree 3—10 m high, with white latex or clear sap (teste Codd). Trunk up to 20 cm in diameter; bark pale brown, rough, deeply and longitudinally fissured, corky. *Leaves*: petiole 1—7 mm long; blade 3—6 x as long as wide, 2.5—12 x 0.5—3 cm, obtuse, rounded, acute or rarely acuminate at the apex. *Inflorescence* 1.5—3 x 2—4 cm. Peduncle 5—10 mm long; pedicels 2—6 mm long. *Flowers* fragrant. *Sepals* light green, 1.1—1.7 x as long as wide, 1.7—2.5 x 1.2—1.5 mm, rounded or obtuse. *Corolla* white and often with a greenish tube, or entirely yellow or orange, pilose inside to 1.5—2 mm below insertion of stamens; tube 2.6—3.2 x as long as the calyx, 2—3.2 x as long as the lobes, 5.5—7.5 mm long, 1.2—1.8 mm wide at the base, 2.2—3 mm wide around the anthers; lobes obliquely and transversely elliptic to suborbicular, 0.25—0.4 x as long as the tube, 0.7—1 x as long as wide, 2—3 x 2.5—3.5 mm, auriculate at the right side of the base. *Stamens* with apex 0.5—1 mm below mouth of corolla tube, inserted 0.55—0.7 of the length of the corolla tube; filaments 0.3—1 mm long; anthers 2.4—5 x as long as wide,



Map 2. ▲ *Gonioma kamassi*; ● *Mascarenhasia arborescens*.

1.2–2 x 0.4–0.7 mm. *Fruit*: follicles narrowly ellipsoid to oblong, 2–6 x as long as wide, 2–6 x 0.8–1 cm, rounded or apiculate at the apex, slightly striate. *Seed* pale brown, grain darker, obliquely oblong, flat, 8–18 x 5–6 x 2 mm, with a short wing at the truncate end and a much longer obtuse wing at the other; grain in seeds of 15–18 mm long 8–10 x 4–5 mm, with irregular raised lines; wings with a minute honeycomb-structure; endosperm cartilaginous; embryo straight, spatulate; cotyledons broadly elliptic, about as long as the rootlet.

Distribution: South Africa, the two Cape Provinces, Coast from Knysna to Pondoland.

Ecology: Forest understorey, mainly near the coast. Alt. 0–900 m.

Geographical selection of the approximately 90 specimens examined:

South Africa. Western Cape: Stellenbosch, Jonkershoek, *Laughton* Sept. 1938 (L); 17 km NW of Assegaaiibosch, *Acocks* 20057 (K, PRE); near George, *Burchell* 6044 (K, L, P), 6071 (GH, K); *ibid.*, Groenkop, *Van der Merwe* 4 (WAG); Karatara, *Schlechter* 5884 (BM, BR, G, HBG, K, L, P, PRE, S, STE, UPS, W, Z); Knysna, *Laughton* anno 1938 (L, U); *ibid.*, *Van Steenis* 23821 (L, WAG); *ibid.*, *Whitish* 163 (STE); Buffelsnek, near Knysna, *Hafstrom & Lindeberg* 9 Dec. 1936 (S); Knysna Forest, *Marloth* 695 (PRE, STE); Deepwells F. R., *Bos* 765 (K, STE, WAG); *ibid.*, *Laughton* 8407 (FHO), 8408 (FHO); Pisang R. valley, *Kapp* 115 (K, P, PRE); Plettenburg Bay, *Rogers* 26833 (G, PRE, Z). Eastern Cape: near Meulrivier, *Drège* b (E, G, HBG, K, L, P, S, W, paratype); Willowmore, Bloukrans Pass, *Goldblatt* 5203 (US, WAG); Tsitsikama, *Penther* 2004 (S, W); Storms R. F.R., *Dahlstrand* 478 (C, GB, PRE), 1661 (PRE); *ibid.*, *Keet* 585 (PRE, STE); Groot R. valley, *Gillett* 1484 (STE); Clarkson, *Thode* A 960 (GH, K, PRE); between Blauwivier Krantz and Kowie Poort, *Burchell* 3659 (GH, K, W); near Galgebosch, Uitenhage Division, *Drège* s.n. (E, G, G-DC, HBG, K, L, P, TCD, W, type of *G. kamassi* var. *brachycarpa*); between Vanstadens R. and Galgebosch, *Burchell* 4676 (K, W); near Van Stadens R., *Drège* a (G, HBG, K, L, P, S, TCD, W, lectotype); Van Stadensberg, *MacOwan* 1055 (A, K, PRE); Van Stadens Nat. Park, *Wells* 3372 (BR, K, PRE, S); Van Stadens Pass, *Acocks* 13739 (K, PRE); Krakakamma Forests, *Ecklon & Zeyher* 3.10 (BP, C, E, F, GH, HBG, L, NY, P, TCD, UPS, W, Z); *ibid.*, *Zeyher* 730 (E, K, S, STE, TCD), 3413 (BP, G, P, S, STE, UPS, W, Z); Suurberg, *Bayliss* BS 6104 (BR, HBG, NY, UC, WAG, Z); Port Elisabeth, *Van Wijk* 3186 (PRU); Dossie Krantz, Grahamstown, *Maude* April 1928 (K); Grobbelaar's Kloof, near Grahamstown, *MacOwan* 534 (F, G, S, TCD); ca 16 km from Grahamstown, *Story* 3238 (K, P); Blauwkrantz Gorge, Albany District, *Cheadle* 733 (BM, FHO, K, W); Howiesons Poort, *Brink* 326 (P); Bathurst Division, *Burchell* 4138 (K); near East London, *Leighton* 236 (BM, G, GH, HBG, K, P, UPS, US, W, Z); Komga, Kloof near Kei R. right bank, *Flanagan* 367 (FHO, G, P); Haven Forest, Mbanyana R., *Gray* 1756 (E). Kwazulu-Natal: Faircress Estate, Oribi Gorge, *Nicholson* 1931 (PRE); Butcher's Place, Durban District, *Strey* 7317 (BR, PRE); Louwsburg, *Hilliard & Burt* 8549 (E, K, PRE, S).

Swaziland, near Mbabane, *Kemp* 1312 (PRE); *ibid.*, Gobolo, *Dhlamini* 18 April 1963 (K, PRE), 6 May 1965 (PRE).

Cultivated. England, Kew Palm Stove May 1871 (K). South Africa, Bot. Garden, Cape Town, *Dümmmer* 1772 (E); Compagnie's Tuin, Cape Town, *Leeuwenberg* 12380 (WAG).

2. 2. *Gonioma malagasy* Markgr. & Boiteau in *Adansonia* II, 12: 225, pl. 1 (1972); Markgraf, *Fl. Mad. fam.* 169: 113, pl. 16, map 24 (1976). — Type: Madagascar, Toliara, km 55-65 Tulear-Sakaraha Road, W of Andranovory, *Capuron* SF 20716 (holotype P; isotypes BR, G, HBG, K, TEF, WAG). Fig. 2, p. 20; map 11, p. 80

Large tree up to 18 m high. Trunk up to 40 cm in diameter; bark brown, rough. *Leaves*: petiole 2–12 mm long; blade (3–)5–6 x as long as wide, 4–11.5 x 1.2–2.1 cm, acuminate at



Fig. 2. *Gonioma malagasy*. 1, habit (x 2/3); 2, intrapetiolar stipules (x 5); 3, opened corolla (x 7); 4, calyx with pistil (x 10); 5, ovary (x 10); 6, fruit (x 2/3); 7, seed (x 1.5). 1-5 from Capuron SF 20716.

the apex. *Inflorescence* 1–2 x 1–2 cm. *Peduncle* 1–4 mm long; *pedicels* 0.2–0.5 mm long. *Flowers*: *Sepals* 1.3 x 1 mm, obtuse. *Corolla* white, pilose inside to 1 mm below insertion of stamens; tube 3.5 x as long as the calyx, 2.2 x as long as the lobes, 4.5 mm long, 1 mm wide at the base, 1.5 mm wide around the anthers, 1 mm wide at the mouth; lobes ovate, 0.4 x as long as the tube, 2 x 1 mm. *Stamens* with apex 1 mm below mouth of corolla tube, inserted at 2.5 mm from the base of the corolla tube; filaments 0.3 mm long; anthers ovate, 1 x 0.4 mm, acuminate at the apex. *Pistil* 3 mm long; ovary ovoid, 1.5 x 1 x 1 mm; style 0.5 mm; pistil head: stigmatic part 0.9 x 0.3 mm; stigmoid apex 0.1 x 0.1 mm. *Fruit*: follicles linear, 4–11 x 0.5–0.7 mm, acuminate or caudate, striate, not lenticellate, often transformed into irregularly subglobose galls.

Distribution: Endemic to SW Madagascar.

Ecology: Dry forest. Alt. low.

Specimens examined:

Madagascar. Toliara: Analafanja, Antseva, SF 15072 (P); Lambomakandro, SF 13059 (P); Sakaraha, SF 13373 (BR, G, K, P), 15607 (P, TEF); Ifazoroa, Sakaraha, SF 3856 (P); Zombitsy Forest, *Humbert et al.* 29587 (K, P); *ibid.*, *Capuron* SF 11909 (BR, G, K, P, WAG); *ibid.*, SF 26884 (P); 15 km S of Sakaraha, *Imbert* 50 (P); km 55–65 Tulear-Sakaraha Road, W of Andranovory, *Capuron* SF 20716 (BR, G, HBG, K, P, TEF, WAG, type); km 63 of same road, SF 3668 (P); Ihera Forest, Tulear, SF 9794 (P); Sakamena R., Beora, SF 14364 (P, WAG). *Sin. loc.*, *Richard* 247 (K).

3. *Mascarenhasia* A. DC., *Prod.* 8: 487 (1844); Pichon in *Mém. Inst. Sci. Madag. Sér. B*, 2: 76 (1949); Markgraf, *Fl. Madag. Fam.* 169: 248 (1976). — Type species: *M. arborescens* A. DC. (lectotype species designated by Pichon).

Heterotypic synonyms: *Tsilaitra* Baron in *Rev. Madag.* 16: 250 (1905). — Type species: *T. micrantha* (Bak.) Baron, lectotype species designated here (= *M. arborescens* A. DC.).

Lanugia N.E. Br. in *Torreyia* 27: 51 (1927). — Type species: *L. latifolia* N.E. Br. (= *M. arborescens* A. DC.).

Echitella Pichon in *op. cit.* 88. — Type species: *E. lisianthiflora* (A. DC.) Pichon (= *M. lisianthiflora* A. DC.).

Shrubs or trees, probably all representing growth model of

Koriba or of Prévost, mostly with white latex in all parts (not in *M. speciosa*; not known of *M. macrosiphon* and *M. tampinensis*). Branchlets terete. *Leaves* opposite, persistent or deciduous, petiolate; (ocreae not or slightly widened into intrapetiolar stipules); blade coriaceous or subcoriaceous. *Inflorescence* axillary and/or terminal, 1–15-flowered, fasciculate when with more than one flower. Peduncle obsolete or short; pedicels often rather long. Bracts sepal-like or nearly so, much smaller than the sepals, persistent. *Flowers* rather large (corolla tube 5–60 mm long), fragrant or not, open during the day. *Sepals* often leafy, green (always?), free, erect or nearly so, subequal or unequal. *Corolla* white, cream, red or pink or in a combination of these colours; tube funnel-shaped (*M. speciosa*) or with a narrow almost cylindrical basal part which abruptly widenes just below the insertion of the stamens into a campanulate or narrowly urceolate apical part; lobes overlapping to the right in bud, almost free to half-way connate and with borders folded inwards in bud, ovate, elliptic or suborbicular, spreading or sometimes recurved. *Stamens* included, inserted about 2 mm above abrupt widening of corolla tube or in *M. speciosa* in widening part of funnel and then slightly or barely included (often exerted in dried flowers); anthers sessile, narrowly triangular, acuminate and sterile at the apex for 0.4–2 mm, fertile for about one half of the remaining part and again sterile below, sagittate at the base and with tails about 1 mm below insertion, glabrous except for the mostly pubescent connective which is coherent with a circular patch with the pistil head above its stigmatic part in mature buds and open flowers, free in young buds. *Pistil* with apex about halfway along anthers; ovary laterally compressed, of 2 separate carpels, surrounded by a glabrous disk, higher or lower than the ovary, 5-parted with crenate, sinuate, lobed or rarely entire lobes; style various; pistil head variously shaped, always with a bilobed stigmatic apex and probably stigmatic only at the extreme base. Ovules many in each carpel. *Fruit* dark brown, almost black, of 2 linear cylindrical follicles, mostly longitudinally striate when dried, abaxially and longitudinally dehiscent, much paler and brownish inside. *Seed* grain dark brown, narrowly elliptic, with a raised line at the hilar side, with the hilum in the middle, convex at the other side, dull, minutely papillose, with apex directed to the apex of the fruit; endosperm thin, surrounding the embryo, amylose; embryo straight, spatulate; cotyledons narrowly ovate, about 4 x as long as the rootlet, rounded at the apex, truncate at the base; coma usually 2–3 x as long as the grain,

medium brown, of a bunch of simple hairs, directed towards the apex of the follicles.

Eight species of which seven endemic to Madagascar; one also in East and Southeast Africa.

Key to the species of *Mascarenhasia*

1. Corolla tube 5—14 mm long, widened at or near the middle.....**1. *M. arborescens***
Corolla tube at least (14—)16 mm long and only if as short as (14—)16 mm then abruptly widened at 0.16—0.24 of the length (*M. lanceolata*).....**2**
2. Corolla tube funnel-shaped, 45—60 mm long, gradually widened from the cylindrical basal part; stamens inserted 0.7—0.85 of the length of the corolla tube which is at 36—49 mm from the base.....**7. *M. speciosa***
Corolla tube abruptly widened into a campanulate or narrowly urceolate part from the cylindrical basal part; stamens often deeply included, inserted just above abrupt widening; leaves rather large when caudate.....**3**
3. Basal part of corolla tube 2—4 mm long; entire tube (14—)16—20 mm long.....**3. *M. lanceolata***
Basal part of corolla tube 7—32 mm long; entire tube 24—60 mm long.....**4**
4. Basal part of corolla tube 0.14—0.2 x as long as the entire tube and about as long as the sepals.....**8. *M. tampinensis***
Basal part of corolla tube 0.3—0.6 x as long as entire tube and often longer than the sepals.....**5**
5. Corolla tube 10—42 x as long as the calyx.....**6**
Corolla tube 2.3—7 x as long as the calyx.....**7**
6. Leaves caudate to acuminate; ovary and style glabrous.....**2. *M. havetii***
Leaves rounded to obtusely short-acuminate; ovary pubescent and style pilose.....**5. *M. macrosiphon***

7. Leaves at least partly hairy, mostly rather thin; corolla white, often partly red or pink; corolla tube 2.3—7 x as long as the sepals. Dry vegetation.....4. **M. lisianthiflora**
 Leaves entirely glabrous, thick; corolla red; corolla tube at least 6.5—9 x as long as the sepals. Wet forest.....6. **M. rubra**

3. 1. Mascarenhasia arborescens A. DC., Prod. 8: 488 (1844); Dubard in Bull. Soc. Fr. 53: 295 (1906) with *M. sessilifolia* Dubard in syn.; Pichon in Mém. Inst. Madag. sér. B, 2: 76 (1949); Markgraf, Fl. Madag. Fam. 169: 251, pl. 42 (1976); Kupicha in Fl. Zambes. 7, 2: 487, t. 116 (1985). — Type: Madagascar, Mahajanga, Bombetoka Bay, *Bojer* s.n. (holotype G-DC).

Figs. 3, p. 25 and 4, p. 26; phot. 1, p. 121; map 3, p. 27

Heterotypic synonyms: *M. angustifolia* A. D.C., l.c.; Markgraf, op. cit. 257, pl. 43, 1; *M. arborescens* subsp. *angustifolia* (A. DC.) Boiteau, Caoutch. Madag. 13 (1943), **syn. nov.** — Type: Madagascar, Antsiranana, Nosy Be, *Richard* 127 & 181 (composite sheet, holotype G-DC; isosyntypes P).

Holarrhena madagascariensis Bak. in Journ. Linn. Soc. Bot. 21: 424 (1885). — Type: Central Madagascar, sin. loc., *Baron* 3242 (holotype K; isotype P).

M. micrantha Bak. in op. cit. 25: 335 (1890). *Tsilaitra micrantha* (Bak.) Baron in Rev. Madag. 16: 250 (1905). *Lanugia micrantha* (Bak.) N.E. Br. in Torreya 27: 53 (1927); *Mascarenhasia arborescens* subsp. *arborescens* var. *micrantha* (Bak.) Boiteau, l.c. — Type: NW Madagascar, sin. loc., *Baron* 5747 (holotype K; isotype P).

M. variegata Britt. & Rendle in Transact. Linn. Soc. II. 4: 26 (1894). *Lanugia variegata* (Britt. & Rendle) N.E. Br. in Torreya 27: 53 (1927). — Type: Malawi, Southern, Mt Mulanje, Whyte 108 (holotype BM; isotypes G, K, Z; phot. of K sheet B, BR, GB, S).

M. fischeri K. Schum. in Engler, Pflanzenw. Ostafrikas C: 318 (1895). — Type: Tanzania, sin. loc., *Fischer* 322 (holotype B†).

M. elastica K. Schum. in Notizbl. Bot. Gart. Berlin 2: 270 (1899), as *caustica* on p. 268. Type: Tanzania, T6, between Dar es Salaam and Mbaffu, near Vikindo, *Stuhlmann* s.n. (holotype B†).

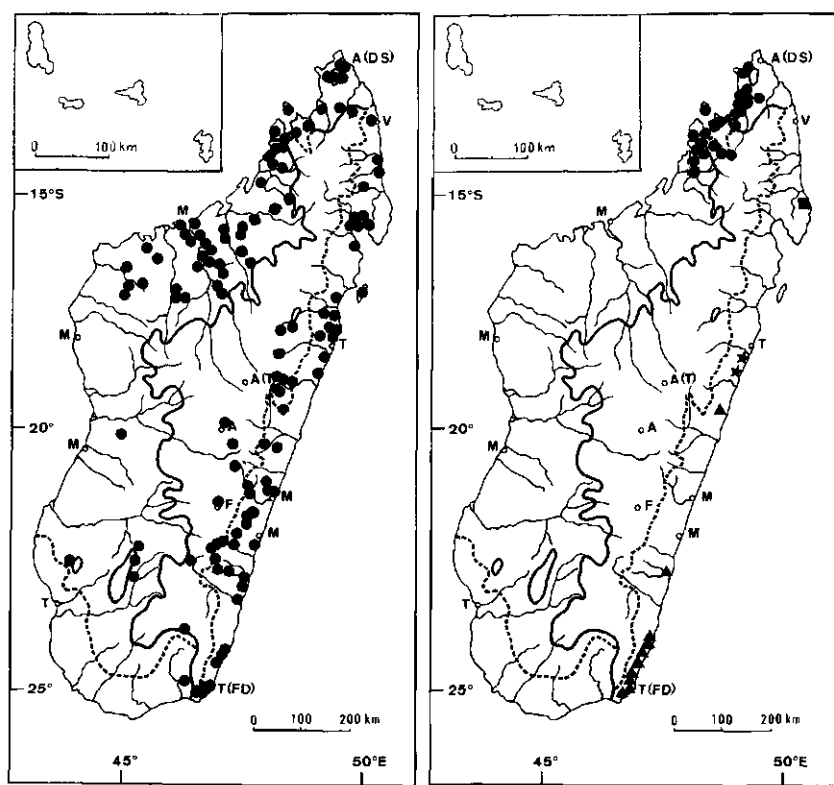
M. anceps Boiv. ex Jum. in Rev. Cult. Colon. 5: 300 (1899); *M. arborescens* var. *anceps* (Boiv. ex Jum.) Lassia, Masca-



Fig. 3. *Mascarenhasia arborescens*. 1, 7 & 9 habit (x 2/3); 2 & 6, leaves (x 2/3); 3 & 8 fruits (x 2/3); 4, seed (x 2/3); 5, transverse section of seed (x 6). 1 from Bosser 8909; 2 from SF 12-R-240; 3-5 from Boivin s.n.; 6 from Perrier de la Bâthie 16555; 7-8 from Lavanchie s.n.; 9 from Capuron SF 20084.



Fig. 4. 1-4. *Mascarenhasia arborescens*. 1-2, habit (x 2/3); 3, sepal inside (x 6); 4, corolla inside with stamens and pistil (x 3). 5-6. *M. macrosiphon*. 5, habit (x 2/3); 6, corolla inside with stamens and pistil (x 3). 1 from Keraudren 1656; 2-4 from Keraudren-Aymonin & Aymonin 25663; 5 from Capuron SF 28431; 6 from Capuron SF 8810.



Map 3. *Mascarenhasia arborescens*.

Map 4. ● *Mascarenhasia lanceolata*; ■ *M. rubra*, ▲ *M. speciosa*; ★ *M. tampi-nensis*.

renhasia et Landolphia 41 (1927). — Type: Madagascar, Antsiranana, Diego-Suarez, Boivin 2461, comm. Richard (lectotype P, designated here).

M. longifolia Jum. in Rev. Gen. Bot. 13: 360 (1901); *M. arborescens* f. *longifolia* (Jum.) Jum. & Perr. in Agric. prat. pays chauds 7: 283 (1907); *M. arborescens* var. *longifolia* (Jum.) Lassia, l.c.; *M. arborescens* subsp. *arborescens* f. *longifolia* (Jum.) Boiteau, l.c. — Type: Madagascar, Mahajanga, Lake Anjiafitsatra, near Mt Tsitondroina, Perrier de la Bâthie 966 (holotype P).

M. arborea Boiv. ex Dubard in op. cit. 300; *M. arborescens* subsp. *arborescens* f. *arborea* (Boiv. ex Dubard) Boiteau, l.c. — Type: Madagascar, Toamasina(?), East coast, Chapelier 93 (lectotype P, designated here).

M. coriacea Dubard in op. cit. 298; *M. arborescens* var. *coriacea*

- (Dubard) Lassia, l.c. — Type: Madagascar, Toliara, Fort-Dauphin, *Scott Elliot* 2703 (lectotype P, designated here; isoelectotypes BM, E, K).
- M. boivinii* Dubard in op. cit. 299; *M. arborescens* var. *boivinii* (Dubard) Markgr. in *Adansonia* II, 12: 588 (1972) and op. cit. 255, pl. 42. 2–5. — Type: Madagascar, sin. loc., *Boivin* s.n. (holotype P).
- M. barabanja* Dubard in op. cit. 301. — Type: Madagascar, sin. loc., *Leboeuf* anno 1899 (holotype P).
- M. grandidieri* Dubard, l.c. — Type: Madagascar, Toamasina, Antsahalaombe Mts, *Grandidier* s.n., rec. 16 Mar. 1878 (holotype P).
- Lanugia latifolia* N.E. Br. in *Torreyia* 27: 52 (1927). — Type: Cult., Puerto Rico, Mayaguez Agric. Exp. Stat., seeds sent from Mozambique, *Britton* 8646 (lectotype NY, designated here, isoelectotypes GH, K, P).
- M. arborescens* subsp. *arborescens* f. *albicorticis* Boiteau, l.c., French description only. — Type not traced, not found in P, nor in TAN.
- M. angustifolia* var. *keraudreniana* Markgr. in *Adansonia* II, 12: 586 (1972); *Fl. Madag. Fam.* 169: 260, pl. 43, 2–4 (1976), **syn. nov.** — Type: Madagascar, Antsiranana, near Diego Suarez, *Keraudren-Aymonin* 25488 (not 25663) (holotype P).
- M. arborescens* var. *comorensis* Markgr. in op. cit. 588 and op. cit. 257, pl. 42, 7–8, **syn. nov.** — Type: Comoro Islands, Anjouan, alt. 600 m, *Lavanchie* March (lectotype P, designated here); *ibid.*, 700 m, *Lavanchie* March (P, paratype); *ibid.*, 700 m, *Lavanchie* April (P, paratype).
- M. arborescens* var. *gracilis* Markgr. in op. cit. 589 and op. cit. 257, pl. 42. 9, **syn. nov.** — Type: Madagascar, Antsiranana, Mt d'Ambre, Makis R., between Roussettes Station and Grande Cascade, *Capuron* SF 20044 (holotype P; isotypes K, TEF, WAG).

Tree or shrub, 1.50–15(–35) m high, with white latex in all parts. Model of Koriba or Prévost. Trunk 3–40(–60) cm in diameter; bark pale or dark brown or pale or medium grey, rather rough or smooth, shallowly and longitudinally fissured or not, often peeling off in large scales, often lenticellate. Branches brown or grey, sparsely lenticellate or not; branchlets glabrous. *Leaves*: petiole glabrous, 1–8 mm long; blade coriaceous even when fresh, elliptic

or obovate to very narrowly so, very variable in shape and size (1.5—)2—4.5(—15) x as long as wide, (1—)4—18 x (0.5—) 2—7 cm, acuminate to retuse at the apex, cuneate at the base or decurrent into the petiole, margin often revolute, glabrous on both sides, with 5—15 pairs of rather straight to upcurved secondary veins forming an angle of 45—80° with the costa, often greatly varying within one leaf; tertiary venation reticulate, conspicuous beneath or not. *Inflorescence* fasciculate, 2—4 x 2—6 cm, 1—15 (—25)-flowered. Peduncle 2—5 mm long, glabrous; pedicels 7—12 mm long, glabrous to puberulous. Bracts sepal-like, 0.2—0.5 x as long as the sepals. *Flowers* sometimes fragrant. *Sepals* pale to dark green, erect, ovate or triangular, 1—2 x as long as wide, 1.5—5.5 x 1.5—4 mm, acute or obtuse, ciliate or ciliolate, sparsely pubescent to glabrous outside, glabrous inside or only at the apex sparsely pubescent, with one continuous row of 35—50 colleters at the base which is 7—10 colleters with each sepal; colleters equal to very unequal, 0.1—0.4 x 0.1—0.3 mm, entire or lobed. *Corolla* cream or white or partly so and then tube greenish or partly red, lobes often red- or purple-striped outside and/or inside and throat often greenish or pale yellow, puberulous or shortly pubescent outside on the lobes and mostly on the upper quarter or half of the tube or less often on the entire tube, pubescent inside on the lobes and in the throat down to the apices of the anthers or even up to as far as the insertion of the stamens, the belt between the apices of the anthers and the the insertion of the stamens even may be covered by 5 stripes of pubescence behind the anthers, then below the insertion of the stamens with 5 stripes of pubescence 1—3 mm long; tube 2.5—5 x as long as the calyx, 0.9—2 x as long as the lobes, 5—14 mm long, widened above the base to 1.7—6 mm wide, contracted at or near the middle to 1—4 mm wide which is just below the insertion of the stamens, again widened around the stamens to 2—5 mm wide and contracted at the throat to 1.5—4 mm wide; limb spreading to recurved, with lobes free to halfway connate; lobes ovate or broadly ovate, 0.6—1.1 x as long as the tube, 1—1.8 x as long as wide, 4—15 x 2—14 mm, apiculate, acuminate or acute. *Stamens* with apex 0.2—1.8 mm below mouth of corolla tube, inserted 0.45—0.6 of the length of the corolla tube (at 5—8 mm from the base); anthers 3—4 x as long as wide, 3.5—5.7 x 1.2—1.5 mm, apex sterile for 0.4—0.7 mm, fertile below for about half of the remaining part; connective sometimes pubescent. *Pistil*: ovary cylindrical, 1—2 x 1.2—2 x 1—1.5 mm, retuse or occasionally acute at the apex,

pubescent at the apex or occasionally entirely glabrous; disk (1—)2—3 mm high which is usually higher than the ovary; style rather robust, pubescent; pistil head almost conical, ca 2 x 1 mm and with widened base. Ovules approximately 30—60 in each carpel. *Fruit*: follicles 6—17.5 x 0.6—2 x 0.6—2 cm. *Seed* grain 10—14 x 2—4 x 0.8—1 mm; embryo 9.5—12 mm long; cotyledons 3.5—4.5 x as long as wide, 7—9 x 2—2.5 mm; rootlet 2—3 x 0.7—0.8 mm; coma 10—20 mm long.

Distribution: East and Southeast Africa, Seychelles, Comoro Islands and Madagascar.

Ecology: On river banks in forest or gallery forest. Alt. 0—1250 m. Leaves in forest spreading, in open places erect.

Geographical selection of the approximately 520 specimens examined:

Kenya. K7: Kilifi District, Pangani Crossing of Lwandani Stream, on Chonyi-Ribe Road, *Faden* et al. 77/532 (BR, K, US, WAG); Kwale District, Marere Forest, *Perdue & Kibuwa* 10220 (BR, FT, K, WAG); Shimba Hills, *Magogo* 1206 (BR, FT, K); *ibid.*, comm. *Batiscombe* May 1907 (K, P, Z); Wanga District, *Dakziel* 3 July 1917 (K).

Tanzania. T3: E Usambara Mts, Amani, *Verdcourt* 1731 (K); Mwera, Mwanza R., *Peter* 39908 (B, WAG); Pangani District, *Bond* 78 (BR, K, M). T6: Morogoro District, Turiani Falls, *Drummond & Hemsley* 1473 (B, BR, FT, K, S); *ibid.*, *Milne-Redhead & Taylor* 7099 (B, BR, K); Pugu Hill, *Hansen* 521 (C). T7: Upper Ruhudje R., Lupembe District, *Schlieben* 1468 (B, P). Pemba: *Vaughan* 774 (K); near Weshia, *Vaughan* 2051 (BM); Sengenya Dya, *R.O. Williams* 99 (BR, K). Zanzibar: *Last* anno 1909 (BR, F, K, P). Mafia Island: Tondwa, *Greenway* 5337 (K).

Malawi. Southern: Mulanje Mt, *Whyte* 108 (BM, G, K, Z; phot. of K sheet B, BR, GB, S, type of *M. variegata*), 155 (TCD); *ibid.*, Likhubala R., *Brass* 16369 (BR, K, NY, PRE, SRGH, UC, US); *ibid.*, *Chapman* 350 (BR, K, MAL), 8931 (E, K); path from Lichenya Hut to Likhubula Mission, *Patel* 857 (BR, K, MAL); Likhubula Forest, *Salubeni* 1643 (K, MAL, SRGH).

Mozambique. Cabo Delgado: between Mocimba da Praia and Quiterajo, *Barbosa* 2115 (LISC). Nampula: Malema, *Gomes e Sousa* 4270 (COI, K, LISC, PRE, SRGH); Ribaué Mts, *Gomes e Sousa* 752 (COI, K, LISC, Z); *ibid.*, *Torre* 654 (COI, LISC), 1110 (COI, LISC); Chinga Mts, *Macedo* 3090 (WAG); Moçambique (= Porto Mocambo), *Campos Andrada* 770 (LISC). Zambézia: Sagura, *Sacleux* 2205 (P); between Gurué and Mocuba, *Mendonça* 1344 (LISC); Altomoloiné, road to Gilé, Napome R., *Campos Andrada* 1911 (COI, LISC); Namagua Plantations, Mocuba District, *Faulkner* 177 (FT, K, S, SRGH), in GH 11734 (BR, K, S, SRGH); Lugela, *Faulkner* 198 (BR, K, NY, PRE, SRGH); *ibid.*, between Mobede and Tacua, *Campos Andrada* 1494 (COI); between Pebane and Mocubela, *Torre* 4723 (LISC); Maganja da Costa, *Sim* 6021 (PRE); km 36 Vila de Maganja-Mocuba Road, *Torre & Correia* 16168 (LISC); Pebane, *Barbosa & Carvalho* 4296 (G, K); near Quelimane, *Luja* 479 (BR). Sofala: Gorongosa Nat. Park, *Tinley* 2566 (K, SRGH); *ibid.*, near Cunduê R., *Macedo* 2385 (WAG);

between Inhaminga and Savane, *Torre* 3070 (LISC); Rio Mupa, *Simão* 783 (K); Beira Region, Chiniziua R., *Gomes e Sousa* 4358 (B, BR, COI, K, LISC, PRE), 4404 (COI, K, LISC, PRE), 4427 (COI, K, PRE, W); Dondo (= Macuacua), *W.H. Johnson* 301 (K, P); near Manga, Beira, *Correia & Marques* 2789 (BR, WAG); Pungwe Swamps, *Pole Evans* 5875 (PRE); Beira, *Swynnerton* 558 (BM, K, SRGH). Manica: Chimani Mts, *Müller* 1121 (K, SRGH); *ibid.*, Musapa Gap, *Wild* 3529 (K, LISC, NY, PRE, SRGH); Dambo, Machango, *Pereira & Marques* 851 (BR, WAG).

Zimbabwe. Manicaland: Pungwe R., *Chase* 6130 (BM, K, LISC, PRE, SRGH), 6447 (K, LISC, PRE, SRGH), 8040 (BM, BR, K, LISC, SRGH); *ibid.*, *Wild* 5261 (COI, K, M, PRE, SRGH); Stapleford F.R., *Mullin* 184/63 (K, LISC, NY, SRGH); Musapa Gap, *Rail* 1/55 (K, PRE, S, SRGH); Chimanmani Mts, *Martin F.R.*, *Mavi* 656 (K, LISC, SRGH); Mt Pesa, *Chase* 2993 (BM, COI, LISC, SRGH); *ibid.*, *Wild* 3577 (K, LISC, NY, PRE, SRGH); Lusitu R., near its junction with Haroni R., *Drummond* 5002 (K, PRE, SRGH).

Seychelles. Mahe: Morne Seychellois Nat. Park, *Procter* 4505 (K).

Comoro Islands. Moheli: between Fomboni and Drondoni, *Bernardi* 11763 (G, K, L, P, Z); Voundrouvou Forest, *Floret* 1232 (P, WAG). Anjouan: *Lavanchie* March (P, lectotype of *M. arborescens* var. *comorensis*); Moya Adda-Doueni Road, *Rakotozafy* 1134 bis (TAN).

Madagascar. Antananarivo: Carion, *Decary* 62 (P). Mahajanga: Mamokomita, Andriba, *Kasombo* SF 12402 (P, TEF, WAG); Mahazoma, *Descoings* 3379 (TAN); *ibid.*, near Tsaratananakely, *Descoings* 3364 (P, TAN); Ankara Mts, *Decary* 14537 (P), 14553 (P); Ambalarano, *Maevatanana*, *Boiteau* 1011 (P); Betsiboka R. valley, near Meavatanana, *Capuron* SF 212 (P, TEF); Tsavongo, Mahavavy, *Dybowsky* 1731 (P); Soalala, Amparihy, SF 31709 (TEF); Tongarejy, Morafeno, Ambato-Boeni, SF 15068 (P, TEF); Madirotelo, SF 4180 (P, TEF); Antsohihy, *Bosser* 5724 (P), 5725 (TAN); 24 km N of Ambondramamy, along Route nat. 6, *Leeuwenberg & Rapanarivo* 14772 (BR, P, TAN, WAG); Lake Anjiafitatra, near Mt Tsitondraina, *Perrier de la Bâthie* 966 (P, type of *M. longifolia*); Tsaramandroso, SF 8146 (P, TEF, WAG); Ankarafantsika Reserve, SF 35 (P), 71 (P), 77 (P); *ibid.*, RN 1119 (P, WAG); Marovoay, *Perrier de la Bâthie* 13435 (P); Ambanjabe Forest, Ambalomoty, *Cours* 3954 (P, TAN, WAG), 3975 (P, TAN, WAG); Namoroka Reserve, SF 4 (NY, P); *ibid.* *Rakotovo* RN 5788 (P); near Bekodoka, *Decary* 8257 (P); Mangobory, Soalala District, SF 3642 (P, TAN, TEF); 15 km SE of Mahajanga, *Lam & Meeuse* 6097 (L, P); Mahajanga, Amborovy Road, *Poisson* 25 (P); Bombetoka Bay, *Bojer* anno 1839 (G-DC, type); Marohoga, SF 5502 (P, TEF); near Majunga, *Humbert* 4064 (P), 4065 (P), 4084 (P); *ibid.*, *Leeuwenberg & Rapanarivo* 14689 (BR, MO, P, TAN, WAG); *ibid.*, Antsanitra, SF 3106 (P, TAN, TEF); Ambalakidy, *Bosser* 5841 (P); 7 km NW of Port Berge, *Leeuwenberg & Rapanarivo* 14700 (TAN, WAG); Tsinjomitondraka, Port Berge (= Boriziny), SF 5519 (P, TEF); Bongolava, Boina, *Perrier de la Bâthie* 8846 (P); Ampakobe, *Rabesoana* SF 35-R-142 (P); km 84 Port Berge-Antsohihy Road, near Anjamangirana, *Leeuwenberg & Rapanarivo* 14721 (BR, MO, P, TAN, WAG); Befandriana, Herb. Jard. Bot. Tana. 5281 (TAN); km 82 Antsohihy-Ambanja Road, between Andrafiabe and Andranosamonta, *Leeuwenberg & Rapanarivo* 14746 (BR, MO, P, TAN, WAG); Moramandia, *Decary* 1052 (BM, P); Ambodinanave, Analalava, SF 10784 (P, TEF, WAG); Maromandia, *Decary* 1065 (K, P, TAN), 1245 (C, P); *ibid.*, Radama Peninsula, *Decary* 1157 (P). Antsiranana: Nosy Be, *Richard* 127 and 181 (G-DC, composite sheet, types of *M. angustifolia*), 127 (P, from Nigny Bay) and 181 (P, from Diego-Suarez); Lokobe Reserve, *Bernardi* 11869 (G, P); *ibid.*, *Pervillé* anno

1851 in *Boivin* s.n. (P, paratype of *M. arborea*); Beraty, Manongarivo R., *Jacquemin* 556 (B, P); near Ankaramy, km 50 Ambanja-Maromandia Road, *Leeuwenberg* et al. 14264 (BR, MO, P, TAN, WAG); Ankarabato, Ambanja, *Bernard* RN 1282 (P, WAG); Benavony, Ambanja, SF 10274 (P, TEF); lower Sambirano R. valley, near Ambanja, *Humbert* 18775 (G, P); km 16 Ambanja-Ambilobe, *Leeuwenberg* & *Rapanarivo* 14750 (BR, MO, P, TAN, WAG); Ampasindava Peninsula, N of Kongony, *Jacquemin* 528 (B, P); near Ananborano, *E.I. White* 2 Dec. 1994 (BM); Mataipaka, SF 29276 (TEF); Ankarana Reserve, *Humbert* 19025 (K, P, US), 19085 (G, P, TAN); *ibid.*, *Keraudren* 1656 (K, P, WAG); *ibid.*, *Leeuwenberg* et al. 14259 (BR, MO, P, TAN, WAG); *ibid.*, *Capuron* SF 18976 (K, P, TEF, WAG); Mt d'Ambre, near Station des Roussettes, *Leeuwenberg* et al. 14315 (BR, MO, P, TAN, WAG); *ibid.*, *Capuron* SF 20044 (K, P, TEF, WAG, type of *M. arborescens* var. *gracilis*); *ibid.*, near Grand Cascade, *Malcomber* et al. 1266 (BR, P, TAN, WAG); near Diego-Suarez, *Pervillé* 169 (P); *ibid.*, *Keraudren-Aymonin* & *Aymonin* 25475 (P, WAG, paratype of *M. angustifolia* var. *keraudreniana*), 25488 (P, type of *M. angustifolia* var. *k.*), 25674 (P, WAG, paratype of *M. angustifolia* var. *k.*); *ibid.*, Mangoako Road, *Debray* 1562 (B, P, WAG); Diego-Suarez, *Boivin* 2461 (P, lectotype of *M. anceps*); km 10 Diego-Suarez to Orangea Road, *Keraudren-Aymonin* & *Aymonin* 25472 (P, WAG); Sahafary Forest, *Debray* 1539 (B, P, WAG, paratype of *M. angustifolia* var. *k.*); *ibid.*, *Keraudren-Aymonin* & *Aymonin* 25635 (P), 25663 (P, paratype of *M. angustifolia* var. *k.*), 25669 (P, WAG), 25676 (P); km 4 Joffreville-Mt d'Ambre Road, *Harder* et al. 1603 (P, TAN, WAG); Antsahalalina, 12 km E of Daraina, *D. Meyers* 269 (K, P, TAN); Ampanihy R., *Pervillé* 285 (P); Vohemar, *Richard* 58 (P), 107 (L, P), 551 (P); Sambava, *Leeuwenberg* & *Rapanarivo* 14416 (BR, MO, P, TAN, WAG); *ibid.*, *Morat* 2805 (P, TAN); E of Ambatobiribiry, *Capuron* SF 876 (P, TEF, WAG); Antalaha, *Roberson* 13 June 1950 (P); Anjanaharibe Res., *Ravelonarivo* et al. 35 (TAN, WAG). Toamasina: Nosy Mangabe, Antongil Bay, *Leeuwenberg* et al. 13907 (TAN, WAG); *ibid.*, *Schatz* et al. 1852 (BR, K, P, TAN, WAG); Maroantsetra, SF 145-R-199 (P); Ivoulona (= Voloina), *Dequaire* 27644 (P); Rantabe R. basin, near Beanana, *Capuron* SF 9062 (P, WAG), 9063 (TEF); Fananehana R. basin, Androrana Mts, *Capuron* SF 8963 (P, WAG); Masoala Peninsula, 1-3 km S of Ambanizana, *Schatz* & *Modeste* 3129 (G, K, P, TAN, WAG); just above Antalavia R., *Schatz* et al. 1929 (BR, C, K, P, TAN, WAG); Antalavia, *Nicoll* et al. 573 (BR, K, P, TAN, WAG); Antrohy, Mananara, SF 26113 (P, TEF, WAG); île Ste. Marie, *Boivin* 1786 (G, P); Zahamena Res., *Randrianjanaka* & *Arnaud* 16 (WAG); Tampolo Forest, 10 km N of Fenerive, *Leeuwenberg* et al. 14469 (BR, MO, P, TAN, WAG); *ibid.*, *Zarucchi* et al. 7380 (F, P, TAN, WAG); Analalava Forest, near Foulpointe, *Leeuwenberg* et al. 14474 (BR, MO, P, TAN, WAG); *ibid.*, *Capuron* SF 22808 (BR, K, P, TEF, WAG); Betampona Reserve, Ambodiriana, *Rakotoniana* RN 5913 (P, WAG); Ifantsy R., *Rakotoniana* RN 2467 (P); Ambendratsara, Manaka Est, *Ramanantsoavina* RN 2350 (P, TAN, WAG); Anjiofotsy, Manakambahiny Est, *Ramanantsoavina* RN 1779 (BR, K, P, WAG); Mandraka Forest, SF 661 (P, TEF, WAG); Marivolanitra, *Robin* SF 32-R-55 (P); Moramanga, *Schlieben* 8128 (B, BM, BR, G, HBG, K, M, TAN, UC, Z); *ibid.*, Anosibe, SF 2193 (P, TAN, TEF), 2194 (P, TEF); Moramanga-Anosibe Road, *Cours* 871 (P, WAG); km 53 and 51 same road, SF 7665 (P, TEF, WAG), 7813 (P, TEF); km 45, Ankazomanitra, SF 26832 (P); Beravina, SF 3771 (P, TEF), 4382 (P, TEF); Between Antsahalanbe and Antananarivo, *Grandidier* s.n. (P, type of *M. grandidieri*); Analamazaotra Forest, S of Perinet, *Leeuwenberg* et al. 13739 (BR, K, P, TAN, WAG); *ibid.*, *Miller* 3768 (BR, K, P, TAN, WAG), 3836 (BR,

K, P, TAN, WAG); Ambodilazana, *Warbur* 21 May 1900 (K); Marongolo R., *Dequaire* 27670 (P, TAN); Anjiro Forest, Brickaville District, *Vetondrozy* SF 12-R-240 (P); near Ambila-Lemaitso, *Leeuwenberg & Rapanarivo* 14584 (BR, MO, P, TAN, WAG); *ibid.* SF 12616 (P, TEF, WAG); Bevakoana, *Abraham* SF 25275 (P, TEF); Sandrangato, *Descoings* 103 (TAN); *ibid.*, *Capuron* SF 28789 (P, TEF). Fianarantsoa: Ambohimombo Forest, *Forsyth Major* 331 (G, K); Ampasimpotsy Forest, Antoetra, SF 29-R-168 (P); N of Azozombe, N Imerina, *Perrier de la Bâthie* 14965 (P); Ampasinambo, Nosy Varika, *Rakotozafy* SF 85-R-116 (P); Marovato Forest, Manaka, *Cours* 3103 (P, TAN, WAG); Mananjary, *Geay* 7744 (P), 7929 (P), 7930 (P), 7931 (P), 7932 (P); *ibid.*, Ambodinana, SF 15462 (P, TEF); Ampasimazava, SF 13679 (P, TEF); Ikongo, SF 14509 (P, TEF, WAG); Andrambovato, Tolongoina, SF 16282 (P, TEF); Ranomafana, SF 4775 (P, TEF); Ranomafana Reserve, *Leeuwenberg et al.* 14132 (BR, K, P, TAN, WAG); *ibid.*, *Malcomber et al.* 1634 (BR, P, TAN, WAG); Antoetra, Saharanga, SF 29-R-168 (P); Ampamaherana, Fianarantsoa, SF 7054 (P, TEF, WAG), 11101 (P, TEF, WAG); Isaloa, *Bosser* 19109 (P, TAN, WAG); *ibid.*, *Perrier de la Bâthie* 16555 (P); Isaloa Plateaux, S of Sahanafo, *Humbert* 19517 (P, WAG); Isaloa, Gorges du Rat, *Keraudren* 410 (P), 433 (P); Cañon des Singes, *Jacquemin* 275 (B, P, WAG); Ranohira, SF 14310 (P, TEF); Sakalema R. valley, *Decary* 14298 (P); Andringitra Res., Iantara R., *Lewis et al.* 760 (BR); *ibid.*, SF 1491 (P, TAN, TEF); upper Iantara R., *Humbert* 3430 (G, P); Karianga, *Decary* 5551 (P); Vondrozo, *Decary* 4896 (P); Anabotany, Vohitrindry, SF 6365 (P, TEF); Bevetraka R., Farafangana, SF 25854 (P, WAG); Manombo Forest, SF 9487 (P, WAG); Vangaindrano, *Scott Elliot* 2207 (P). Toliara: Manampanihy R. basin, Fitana Pass, *Humbert* 6052 (G, P, US); N of Manantanina, *Faber-Langendoen et al.* 2984 (P, TAN); Analava Forest, Manantenina, *Guillaumet* 3853 (P, TAN); Fort-Dauphin, *Scott Elliot* 2361 (E), 2440 (K), 2463 (BM), 2703 (BM, E, K, P, lectotype of *M. coriacea*); *ibid.*, Pic St. Louis, *Leeuwenberg et al.* 14208 (BR, K, P, TAN, WAG); Mandena F.R., N of Fort-Dauphin, *Dumetz et al.* 504 (K, P, TAN, WAG); *ibid.*, *Gereau et al.* 3298 (BR, K, P, TAN, TEF, WAG); *ibid.*, *Leeuwenberg et al.* 14202 (BR, K, P, TAN, WAG); Andohahela Reserve, Parcelle 1, *Leeuwenberg* 14187 (BR, K, P, TAN, WAG); *ibid.*, *Malcomber et al.* 1667 (BR, P, TAN, WAG); *ibid.*, *Phillipson* 2963 (BR, K, P, TAN, WAG); *ibid.*, *Randriampionona* 100 (TAN, WAG); Parcelle 2, 2 km S of Sakaravy, *Leeuwenberg* 14160 (BR, K, P, TAN, WAG); Parcelle 3, *Phillipson* 2681 (K, P, TAN, WAG); N of Fort-Dauphin, along road to Ranomafana, *McPherson* 14626 (K, P, TAN, WAG); upper Mananara R. valley, *Decary* 9407 (C, GB, P); Tsilitsily, Behara, *Rakotoson* RN 9431 (P); Ivakoany Mts, *Humbert* 12195 (P); Beravy Mts, *Hildebrandt* 2078 (BM, G, K, M, P, W); Kirindy Forest, 55 km NE of Morondava, *Noyes et al.* 1080 (BR, P, WAG). Sin. loc.: *Baron* 3242 (K, P, type of *Holarrhena madagascariensis*), 5747 (K, P, type of *M. micrantha*), 5767 (P), 6157 (K, P), 6433 (K, P); *Bernier* 169 (BR, G, P), 285 (B, P), 287 (G, P); *Boivin annis* 1847-1852 (P, type of *M. boivinii*); *Chapelier* 93 (P, lectotype of *M. arborea*); *Commerson s.n.* (BM, FI-W, G, P, P-JU); Herb. *Du Petit-Thouars s.n.* (P); *Godefroy Leboeuf* anno 1899 (P, type of *M. barabanja*).

Cultivated. U. S. A: Florida, Fort Meyers, Edison Estate Gardens, *Brumbach* 6634 (HAL, UPS), 7340 (K); Fairchild Tropical Garden, *Gillis* 9562 (S, USF). Puerto Rico: Mayaguez, Federal Exp. Station, *Britton* 8646 (GH, K, NY, P, lectotype of *Laugia latifolia*); *ibid.*, *Hess* 3017 (NY, paratype of *L. latifolia*); *ibid.*, *McClelland* June 1926 (GH, NY, P, paratype of *L. latifolia*); *ibid.*, *Wagner* 1145 (A). Brazil: Botanic Garden of Rio de Janeiro, RB 190314 (HBG). U.K.: Kew, Palmhouse H 873/66 (K); *ibid.*, *Horne* May 1878 (K); Edinburgh, Palm House, 9217 (E), of same tree C 12208 (E). Netherlands,

Wageningen, Greenhouse, cutting received from Edinburgh, *Leeuwenberg* 12180 (WAG); of same tree, *Van Setten* 835 (WAG). Ghana: Aburi Gardens, *Irvine* 1905 (E); Togo, near Lomé, *Warnecke* 481 b (BM, P). Cameroun: Victoria (= Limbe) Botanic Garden, *Leeuwenberg & Berg* 9834 (BR, C, HBG, P, WAG); *ibid.*, *Leeuwenberg* 10568 (BR, HBG, K, P, WAG). Gabon: Njégoné (?), *Pobéguin* 95 (P). Zaïre: Equateur, Eala, *Corbisier-Baland* 2074 (BR, C, K, LG, M, P, UPS, WAG). Angola: Cabinda, Mayumbe, Panga Mungo, Rio Luango, *Gossweiler* 6087 (LISU), 6887 (BM); Bucu Zau, *Gossweiler* 7328 (LISU). Tanzania: Amani, *Greenway* 2285 (K), 6660 (K); *ibid.*, *Peter* 58123 (B, WAG); *ibid.*, *Ruffo* 1034 (K, WAG). Zimbabwe: Salisbury (= Harare), *Biegel* 4692 (K). Madagascar: Antananarivo, Tsimbazaza Park, *Bosser* 8909 (P, TAN); *ibid.*, *Harizo* RN 18 Sept. 1947 (BR, K, P, WAG). Mauritius: Pamplemousses Bot. Gardens, *Guého* MAU 13643 (MAU); *ibid.*, *Vaughan* MAU 11586 (MAU), 12023 (MAU). India: Bot. Garden Calcutta, *Gage* July 1903 (G); Lucknow Bot. Gardens, *Balapure* 72474 (A). Sri-Lanka: Bot. Garden Peradeniya H. 29. R.B.a, *Jayaweera* 1154 (A). Singapore: Bot. Garden, *Furtado* SING 34829 (BM, BO, L), 17 June 1929 (A, FHO, K). Philippines: Los Banos, *Baker* 1 Dec. 1913 (P). Indonesia: Java, Bogor Bot. Garden, IV. A. 131 (BO, K, L, P), 131 a (BO, WAG); LV. A. 131 a, *Woejantoro* 137 (K, L); Tjikeumeuh Bot. Garden Sept. 1902 (BO), Jan. 1909 (BO), sin dat. (L 922.62-518).

Notes. The leaves vary greatly in shape and size. In most specimens they are up to 4.5 x as long as wide, but in some specimens collected they may be up to 15 x as long as wide. They are 2.2–5 x as long as wide in *Keraudren-Aymonin* 25475 (paratype of *M. angustifolia* var. *keraudreniana*), 4.5–5.5 x in *Keraudren-Aymonin* 25674 (paratype of same taxon), 5–5.5 x as long as wide in *Debray* 1539 (paratype of same taxon), 6–9 x in *Debray* 1562, 5–10 x in *Humbert* 19085, 9–11 x in *Capuron* SF 18976 and 10–15 x in *Keraudren* 1656. The continuity in this variation makes it impossible to maintain both *M. angustifolia* var. *angustifolia* and *M. a.* var. *keraudreniana*. The shape and size of the flowers vary independently from the leaves. The type and the topotype, *Leeuwenberg* 14315, of *M. arborescens* var. *gracilis* are much more branched and have smaller leaves than most other specimens belonging to this species. However, the flowers are not the smallest found in the species. Plants of *M. arborescens*, which were isolated by deforestation, have the leaves erect instead of horizontal to reduce irradiation.

3. 2. *Mascarenhasia havetii* A. DC., Prod. 8: 488 (1844); Markgraf, Fl. Madag. Fam. 169: 262, pl. 44. 4 (1976). — Type: Madagascar, Toamasina, Betanimena, near Manambonitra, *Havet* in *Bojer* s.n. (holotype G-DC; isotypes BM, K, MAU n.v., P).

Fig. 5, p. 35; map 6, p. 36

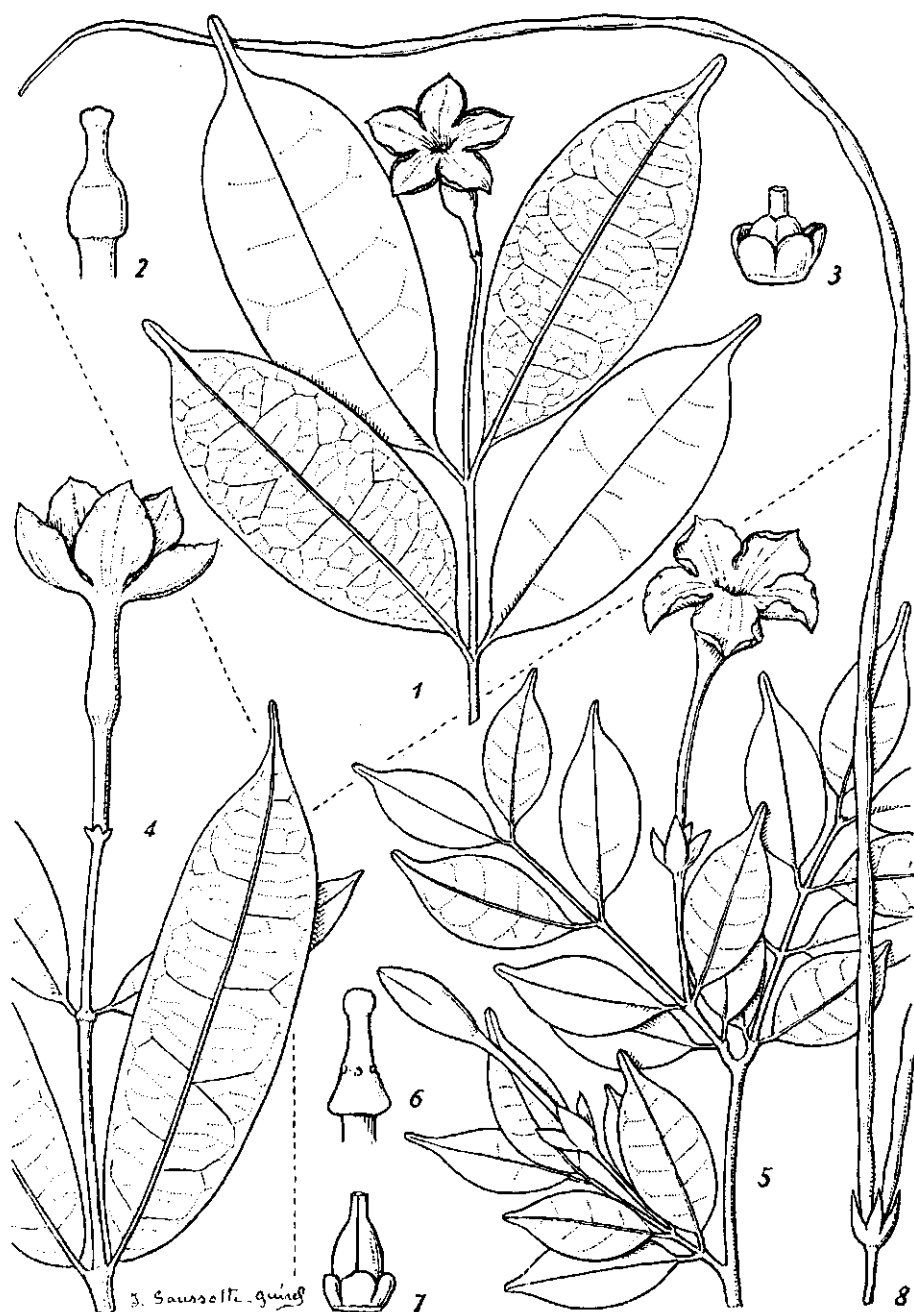
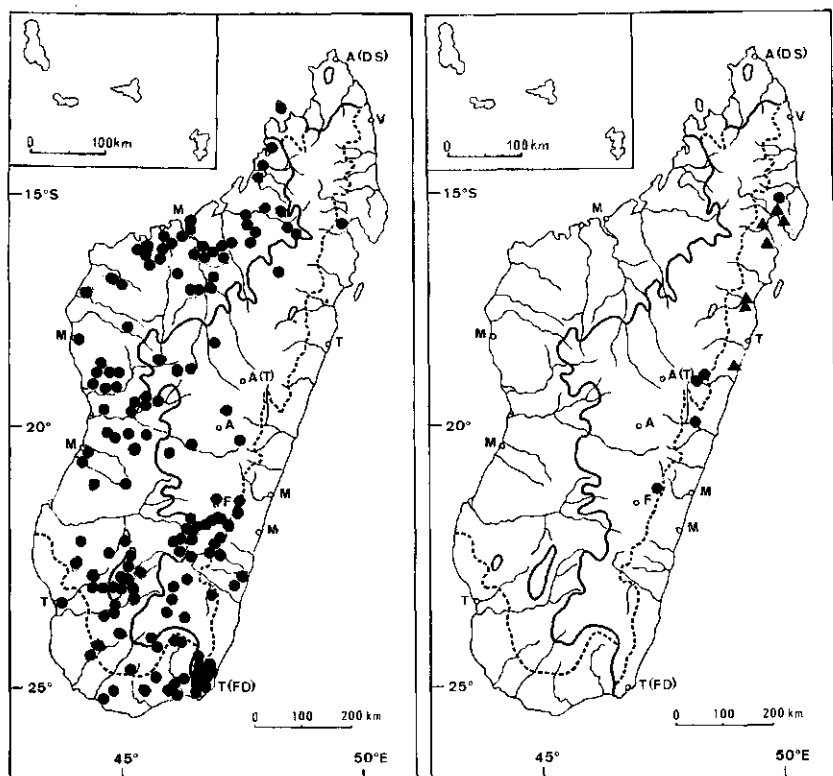


Fig. 5. 1-4, *Mascarenhasia havetii*. 1 & 4, habit (x 2/3); 2, pistil head (x 6); 3, ovary with disk (x 6). 5-8, *M. speciosa*. 5, habit (x 2/3); 6, pistil head (x 6); 7, ovary with disk (x 6); 8, fruit (x 2/3). 1-2 from Capuron SF 9157; 3 from Capuron SF 9478; 4 from Havet in Bojer s.n.; 5-7 from Scott Elliot 2177; 8 from Humbert 5804.



Map 5. *Mascarenhasia lisianthiflora*.

Map 6. ▲ *Mascarenhasia havetii*; ● *M. macrosiphon*.

Homotypic synonym: *M. speciosa* var. *havetii* (A. DC.) Boiteau, Caoutch. Madag. 8 (1943).

Heterotypic synonyms: *M. maroana* Aug. D.C. in Bull. Herb. Boiss. II, 1: 580 (1901); Markgraf, Fl. Madag. Fam. 169: 261, pl. 44, 1-3 (1976), **syn. nov.** — Type: Madagascar, Toamasina, Maroantsetra, *Mocquerys* 271 (holotype G; isotype Z).

M. thiryana Pierre ex Dubard in Bull. Soc. Bot. Fr. 53: 303 (1906). — Type: NE Madagascar, coast, sin. loc., *Thiry* s.n. (holotype P; isotype K).

Shrub or small tree, 4–8 m high, with white latex in all parts. Branches pale or dark brown, lenticellate; branchlets glabrous or puberulous at the apex. *Leaves*: petiole glabrous or puberulous, 2–5 mm long; blade subcoriaceous when dried, elliptic, 2.5–3.5 x as long as wide, 4.5–12.5 x 1.4–3.7 cm, caudate to acuminate at the apex, cuneate at the base or decurrent into the petiole, margin not

revolute, glabrous on both sides or with a few hairs on the base of the costa beneath, with 5–9 rather straight obscure secondary veins forming an angle of 60–80° with the costa; tertiary venation inconspicuous. *Inflorescence* 1–3-flowered. Peduncle 1–3 mm long, puberulous; pedicels slender, 20–40 mm long, sparsely puberulous or glabrous. Bracts sepal-like and about half as long as them. *Flowers*: *Sepals* light green, erect, triangular or ovate, 0.7–2.5 x as long as wide, 1–3 x 1–1.5 mm, acute, ciliolate, pubescent or sparsely so outside, glabrous inside and with one row of 5 colleters inside at the base; colleters 0.2 x 0.1 mm. *Corolla* white, puberulous outside on the lobes, mostly only on the part covered in bud and sometimes at the apex of the tube, otherwise glabrous or even entirely glabrous, pilose on 2 mm of the filament ridges (near connective), otherwise glabrous but on lobes pubescent; tube 10–42 x as long as the calyx, 1–2.5 x as long as the lobes, 24–42 mm long, above the base 1.5–2 mm wide, abruptly widened 0.32–0.6 of the length from the base which is at 8–21 mm to 5–7 mm wide, almost remaining at the same width to the mouth and 5–8 mm wide; limb spreading with lobes up to nearly halfway connate; lobes ovate or suborbicular, 0.4–0.5 x as long as the tube, 1.1–1.8 x as long as wide, 10–22 x 7–18 mm, acuminate or apiculate. *Stamens* with apex 3–12 mm below mouth of corolla tube, inserted 0.32–0.5 of the length of the corolla tube (at 10–22 mm from the base); anthers 4–5 x as long as wide, 8–10 x 1.5–2 mm, apex sterile for 1–1.5 mm, fertile below for about half of the remaining part; connective pubescent. *Pistil*: ovary ovoid, 2–2.5 x 1.2–1.5 x 1 mm, retuse at the apex, glabrous; disk 0.7–1 mm high; style rather slender, glabrous; pistil head of a basal entire veil 0.5 x 1 mm and a stigmoid apex 1.5 x 0.5 mm. *Fruit* only immature ones known; follicles very slender, 15–20 x 2 mm.

Distribution: Eastern Madagascar.

Ecology: Forest understorey. Alt. low.

Specimens examined:

Madagascar. Toamasina: Masoala Peninsula, N of Antalavia R., Schatz et al. 1933 (BR, K, P, TAN, WAG); Maroantsetra, *Mocquerys* 271 (G, Z, type of *M. maroana*); Vohilava R. basin, tributary of Rantabe R., *Capuron* SF 9157 (P, TEF, WAG); Mahavoho Forest, km 9.5 Ibanda Road, *Raharimalala* 158 (P), 198 (P), 200 (P); Mananara Nord, Ibanda Forest, *Raharimalala* 368 (P); Onilava, Sahatavy, *Ramarokoto* RN 9478 (P, TAN, WAG); Zahamena Reserve, *Botoalina* RN 3166 (P); Betanimena, near Manambonitra, *Havet* in *Bojer* s.n. (BM, G-DC,

K, MAU n.v., P, type). Sin. loc.: *Bowles* s.n. (K); *Lyall* 146 (K); *Thiry* anno 1904 (K, P, type of *M. thiryana*).

Note. The flowers of the type of *M. havetii* are larger than in most other specimens of this species seen. In all other characters the specimens examined are perfectly similar, therefore *M. maroana* is reduced to synonymy.

3. 3. Mascarenhasia lanceolata A. DC., *Prod.* 8: 488 (1844); Markgraf, *Fl. Madag. Fam.* 169: 272, pl. 46, 6—7 (1976). — Type: Madagascar, Antsiranana, Nosy Be, *Richard* 370 (holotype G-DC; isotype P). Fig. 6, p. 39; phot. 2, p. 121; map 4, p. 27

Homotypic synonym: *Tsilaitra lanceolata* (A. DC.) Baron in *Rev. Madag.* 16: 250 (1905).

Heterotypic synonyms: *M. brevituba* Vatke in *Abh. Naturw. Ver. Bremen* 9: 125 (1885). — Type: Madagascar, Antsiranana, Nosy Be, *Hildebrandt* 3299 (lectotype BREM, designated here; isolectotypes BM, G, K, L, M, P, W).

M. rosea Bak. in *Journ. Linn. Soc.* 25: 335 (1890). — Type: NW Madagascar, sin. loc., *Baron* 5840 (holotype K).

M. utilis Bak. in *Kew Bull.* 1895: 199 (1895), nomen; Hooker, *Icon.* 24: t. 2390 (1895). — Type: N Madagascar, sin. loc., *Baron* 6370 (holotype K; isotype P).

M. parvifolia Dubard in *Bull. Soc. Bot. Fr.* 53: 307 (1906). — Types: Madagascar, Antsiranana, near Diego-Suarez, *Hamelin* in *Godefroy Leboeuf* anno 1900 (lectotype P, designated here; isolectotype BR); Nosy Be, Sakatia, *Boivin* Feb. 1851 (paratype P).

Shrub or small tree 1—6 m high, with white latex in all parts. Model of Koriba or Prévost. Trunk 1—10 cm in diameter; bark smooth, pale grey-spotted or pale grey-brown. Branches pale grey-brown, lenticellate; branchlets puberulous. *Leaves*: petiole, puberulous or glabrous, 1—6 mm long; blade coriaceous even when fresh, elliptic or less often obovate, 1.7—4(—6.5) x as long as wide, 2—8 x 0.7—2.5 cm, acuminate to rounded at the apex, cuneate at the base, margin often revolute, glabrous on both sides or slightly puberulous on base of costa beneath, with 5—12 pairs of rather straight secondary veins forming an angle of 45—90° with the costa; tertiary venation reticulate, inconspicuous or invisible. *Inflorescence*

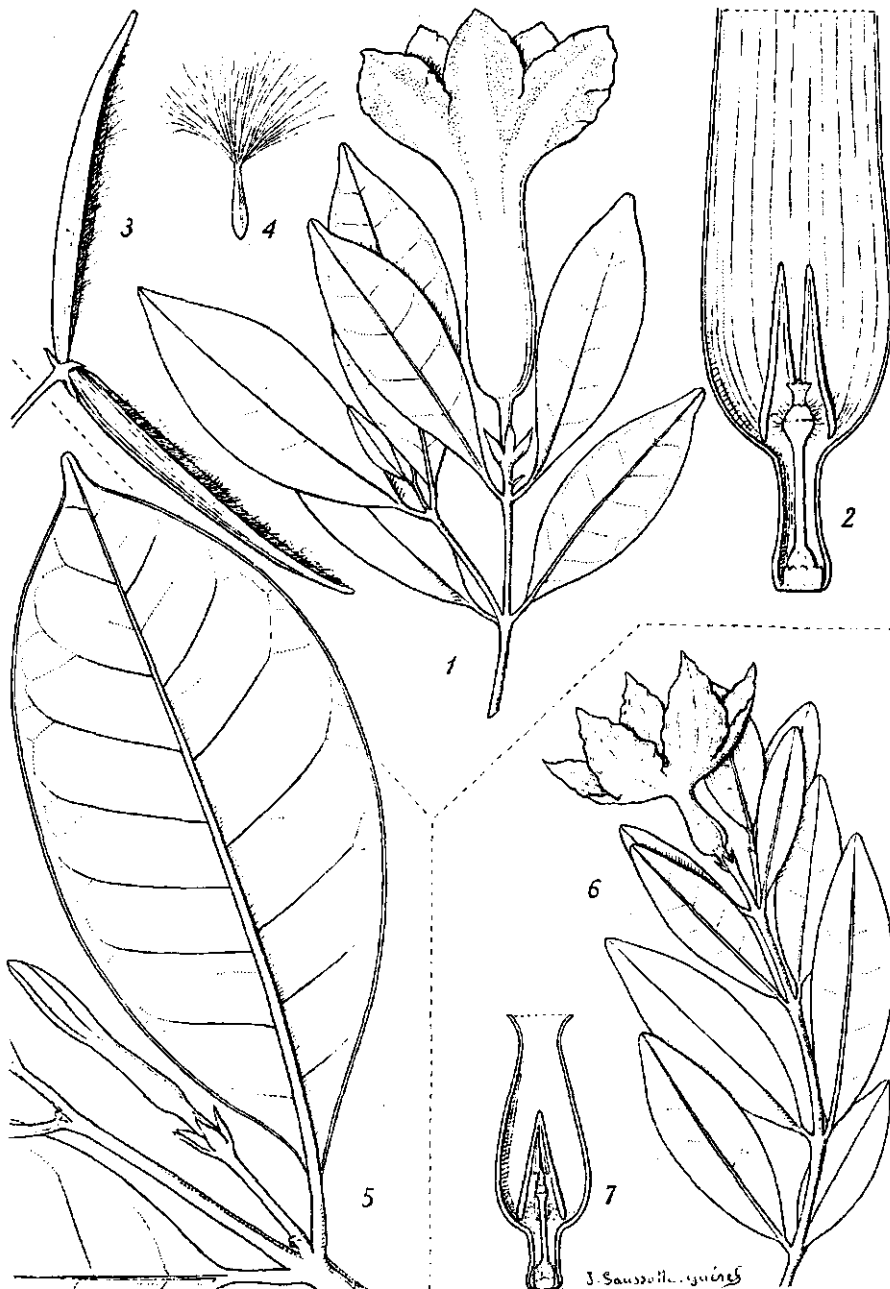


Fig. 6. 1-5. *Mascarenhasia tampinensis*. 1, habit (x 2/3); 2, corolla tube inside with stamens and pistil (x 2); 3, fruit (x 2/3); 4, seed (x 1). 5. *M. rubra*. 5, habit (x 2/3). 6-7. *M. lanceolata*. 6, habit (x 2/3); 7, corolla inside with stamens and pistil (x 2). 1-2 from RN 5; 3-4 from Humbert & Swingle 5717; 5 from Perrier de la Bâthie 18267; 6 from Bosser 13232; 7 from Cours 5647.

1—4-flowered, about as long as the leaves. Peduncle 0—2 mm long, puberulous; pedicels 8—20 mm long, puberulous. Bracts scale-like, about 1 mm long, acute, puberulous. *Flowers*: *Sepals* medium green, free, suberect, ovate or oblong, 2—3 x as long as wide, 4—7 x 1.5—2.8 mm, obtuse, ciliolate, puberulous on both sides, with one continuous row of 35—50 colleters at the base which is 7—10 of them with each sepal; colleters equal or unequal, 0.1—0.4 x 0.1—0.2 mm. *Corolla* white, sometimes with a yellow throat and partly pink outside, puberulous outside but mostly glabrous or nearly so on the narrow basal part of the tube, puberulous inside on the lobes and villose from the insertion of the stamens to the mouth; tube 2.7—4.5 x as long as the calyx, 0.55—1 x as long as the lobes, (14—)16—20 mm long, 1.5—2 mm wide above the base, abruptly widened at 0.16—0.24 of the length which is at 2—4 mm to 4.5—5 mm wide, gradually narrowed towards the mouth to 1.5—2.5 mm wide, again widened at the mouth to 4—5 mm wide; limb spreading or nearly so, with lobes almost free; lobes 1—1.47 x as long as the tube, 1.9—3 x as long as wide, 17—30 x 6—17 mm, acuminate. *Stamens* with apex 5—9 mm below mouth of corolla tube, inserted 0.25—0.3 of the length of the corolla tube (at 5—6 mm from the base); anthers 3—5 x as long as wide, 6—7.5 x 1.5—2 mm, apex sterile for 1—1.5 mm, fertile below for 2—3 mm. *Pistil*: ovary cylindrical, 1.5—2 x 2 x 1.5 mm, retuse at the apex, pubescent except for the glabrous base within the disk; disk 0.5 mm high; style rather robust, glabrous; pistil head consisting of a subglobose basal part about 1 x 1 mm with which the anthers cohere, or a veil 0.5 x 1 mm and a stigmoid apical part about 1 x 0.5 mm. Ovules approximately 30 in each carpel. *Fruit*: follicles cylindrical, 9—17 x 0.5—0.8 cm. *Seed* 7—10 x 1.5 x 0.5 mm; embryo 6.2 mm long; cotyledons 4.7 x 1.4 mm; rootlet 1.5 x 0.5 mm; coma 12—15 mm.

Distribution: NW Madagascar.

Ecology: Dry forest or woodland on laterite or limestone. Alt. 0—1000 m.

Geographical selection of the approximately 75 specimens examined:

Madagascar. Antsiranana: Analamera Hills, *Humbert* 1915 (P); Ankarana Hills, *Humbert* 18870 (P), 18871 (G, P); Ankarana Reserve, *Leeuwenberg* et al. 14260 (BR, MO, P, TAN, WAG); Andranomena, *Debray* 1553 (P, WAG); Diego-Suarez, *Boivin* 2459 (P); Ambohipiraka Mt, *Humbert & Cours* 32865 (P, WAG); near Ambatoarana, *Descoings* 1923 (TAN); Nosy Be, *Boivin* Feb. 1851 (P,

paratype of *M. parvifolia*); *ibid.*, *Hildebrandt* 3299 (BM, BREM, G, K, L, M, P, W, lectotype of *M. brevifolia*); *ibid.*, *Richard* 312 (P), 370 (G-DC, P, type); *ibid.*, Lokobe Reserve, *Bernardi* 11843 (G, K, L, P, Z); *ibid.*, *Boivin* March 1851 (P); Nosy Be, Amporaha, *Bosser* 13232 (P, TAN); Nosy Be, Mt Passot, *Derooin & Badré* 189 (BR, K, P, WAG); lower Sambirano R. basin, near Ambanja, *Humbert* 18773 (K, P, TAN, US, WAG), 18776 (P), 18777 (G, P, WAG); Ampasindava Peninsula, *Jacquemin* 479 (P), 535 (B, P); km 11 Ambilobe-Ambanja Road, *Leeuwenberg et al.* 14261 (BR, MO, P, TAN, WAG), 14262 (BR, MO, P, TAN, WAG); 3 km S of Mahamanina, *Leeuwenberg & Rapanarivo* 14749 (BR, MO, P, TAN, WAG); km 42 Ambanja-Moramandia Road, *Leeuwenberg et al.* 14263 (BR, MO, P, TAN, WAG); Maromandia, SF 31869 (TEF); between Andrafiabe and Andranosamonta, *Leeuwenberg & Rapanarivo* 14745 (BR, MO, P, TAN, WAG); Anaborano, Diego-Suarez, *E.I. White* 2 Dec. 1929 (BM); Ambolibe, *Decary* 14777 (GB, P, S), 14780 (K, P, TAN), 14787 (P); *ibid.*, *Waterlot* 336 (P); Galoka Mts, SW of Ambilobe, *Phillipson* 2006 (K, P, TAN); Ampondrabe, Ambanja, SF 5841 (P, WAG); Sambirano R. source, *Last* Dec. 1890 (K); upper Sambirano R., *Perrier de la Bâthie* 15215 (P); Beangona, *Harizo* RN 1280 (P, TAN); *ibid.*, *Tsilizy* RN 6963 (P, WAG); Marotolana, RN 22 (P); *ibid.*, *Rakoto* 5 Jan. 1950 (TAN); W side of base of Manongarivo Mts, *Gentry* 11894 (TAN). Mahajanga: Maromandia, *Decary* 923 (P), 957 (P), 972 (P), 1326 (P); Sambirano, S of Maromandia, *Capuron* SF 18893 (K, P, TEF, WAG); Ankara Mts, *Decary* 14561 (G, L, P). Sin. loc.: *Baron* 5840 (K, type of *M. rosea*), 6370 (K, P, type of *M. utilis*); *Hamelin* in *Godefroy Leboeuf* anno 1900 (BR, P, type of *M. parvifolia*).

3. 4. Mascarenhasia lisianthiflora A. DC., *Prod.* 8: 487 (1844); Markgraf, *Fl. Madag. Fam.* 169: 265, pl. 1—5 (1976). — Type: Madagascar, Mahajanga, Bombetoka Bay, *Bojer* s.n. (lectotype G-DC, designated here, as it has the fruit described; isolectotypes MAU, n.v., P). Fig. 7, p. 42; photos 3, p. 122 and 4, p. 122; map 5. p. 36

Homotypic synonym: *Echitella lisianthiflora* (A. DC.) Pichon in *Mém. Inst. Sci. Madag. sér. B*, 2: 90 (1949).

Heterotypic synonyms: *M. macrocalyx* Bak. in *Journ. Bot.* 20: 219 (1882); *M. lisianthiflora* subsp. *macrocalyx* (Bak.) Boiteau, *Caoutch. Madag.* 9 (1943); Markgraf, *op. cit.* 266, pl. 45, 6—7. — Type: Madagascar, sin. loc., *Baron* 92 (holotype K; isotype P).

M. rutenbergiana Vatke in *Abh. Naturw. Ver. Bremen* 9: 124 (1885). — Type: Madagascar, sin. loc., *Rutenberg* 2 Nov. 1877 (holotype BREM n.v.).

M. velutina Jum. in *Compt. Rend. Acad. Sci. Paris* 128: 1351 (1899). — Type: Madagascar, Mahajanga, Betsiboka R., *Perrier de la Bâthie* 420 (lectotype P, designated here).

M. lisianthiflora var. *pubescens* Dubard in *Bull. Soc. Bot. Fr.* 53: 258 (1906). — Type: Madagascar, sin. loc., *Baron* 5787 (lectotype P, designated here; isolectotype K).

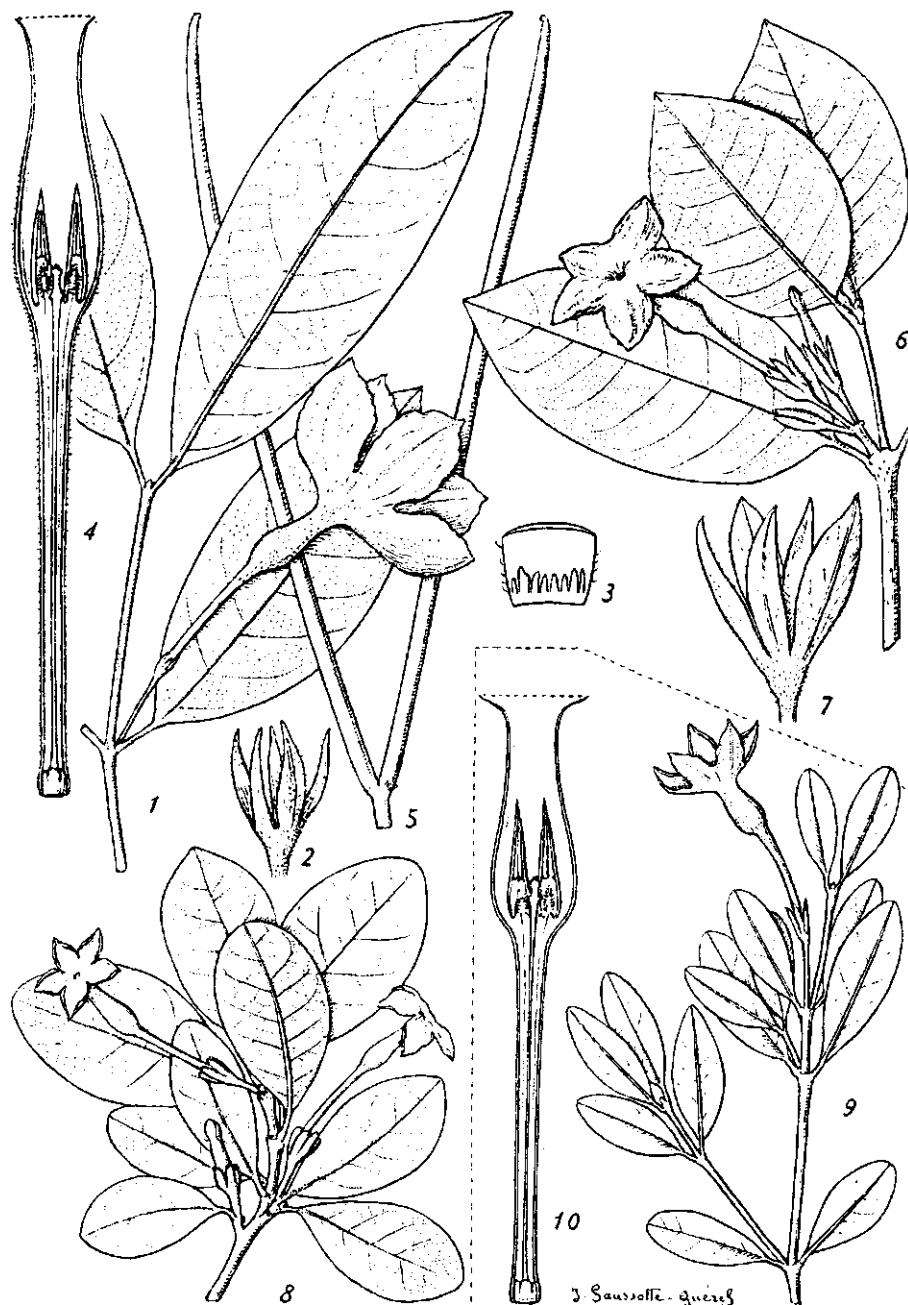


Fig. 7. *Mascarenhasia lisianthiflora*. 1, 6, 8 & 9 habit (x 2/3); 2 & 7, calices (x 2); 3, sepal base inside (x 8); 4 & 10, corolla inside with stamens and pistil (x 2); 5, fruit (x 2/3). 1-4 from Perrier de la Bâthie 8956; 5 from SF 3125; 6-7 from Keraudren 1548; 8 from Capuron SF 548; 9 from Homolle 1542; 10 from Cours 5024.

- M. lisianthiflora* var. *baronica* Dubard in op. cit. 259. — Type: Central Madagascar, sin. loc., *Baron* 4716 (holotype P; isotypes BM, K).
- M. lisianthiflora* var. *hybrida* Dubard in op. cit. 259. — Type: Madagascar, sin. loc., *Baron* s.n. (holotype P; putative isotype *Baron* 92, K).
- M. phyllocalyx* Dubard in op. cit. 261. — Type: Madagascar, sin. loc., *Grevé* 100 (holotype P; isotypes K, TAN, WAG).
- M. humblotii* Dubard in op. cit. 262. — Type: Madagascar, sin. loc., *Humblot* 204 (lectotype P, designated here; isoelectotype WAG).
- M. pallida* Dubard in op. cit. 262. — Type: Madagascar, Fianarantsoa, Ihorombe, *Catat* 4388 (holotype P).
- M. tenuifolia* Dubard in op. cit. 263. — Type: Central Madagascar, sin. loc., *Baron* 4575 (holotype P; isotypes E, K).
- M. kidroa* Cost. & Bois. in Compt. Rend. Acad. Sci. Paris 144: 1054 (1907). — Type: Madagascar, Antananarivo, District Ankazoabo, *Geay* 5983 (holotype P).
- M. geayi* Cost. & Bois., l.c.; *M. lisianthiflora* subsp. *geayi* (Cost. & Bois.) Boiteau, Caoutch. Madag. 10 (1943); Margraf, op. cit. 269, pl. 45, 8. — Type: Madagascar, Toliara, Taheza Mts, E of Tulear, *Geay* 6007 (holotype P).
- M. perrieri* Lassia, Mascarenhasia et Landolphia Madag. 48 (1927); Markgraf, op. cit. 270, pl. 45, 9—10, **syn. nov.**; *Echitella perrieri* (Lassia) Pichon in Mém. Inst. Sci. Madag. sér. B, 2: 90 (1949). — Type: Madagascar, Fianarantsoa, Mania R. basin, *Perrier de la Bâthie* 12552 (holotype P; isotypes K, TAN).

Shrub or small tree, 0.50—8 m high, with white latex in all parts. Trunks up to 25 cm in diameter; bark pale grey, smooth, lenticellate, often peeling off in large scales. Branches pale to dark brown, lenticellate; branchlets pubescent or puberulous. *Leaves*: petiole pubescent or puberulous, 1—10 mm long; blade subcoriaceous or coriaceous even when fresh, elliptic or narrowly so, 1.1—3(—4.5) x as long as wide, 1.5—12 x 0.5—7 cm, variable in shape and size, rounded to acuminate at the apex, truncate to cuneate at the base, margin mostly not revolute, pubescent to almost glabrous on both sides, with indumentum usually at least on costa above and main veins beneath; with 4—12 pairs of rather straight to upcurved secondary veins forming an angle of 45—90° with the costa; tertiary

venation reticulate, conspicuous or not. *Inflorescence* 1—6-flowered. Peduncle 1—4 mm long, pubescent or puberulous; pedicels 5—12 mm long, pubescent or puberulous. Bracts scale-like, much smaller than the sepals. *Flowers* fragrant. *Sepals* pale green, often suffused with dark red, erect, unequal, obliquely elliptic or oblong, 2.3—7 x as long as wide, largest of a flower 6—15 x 1.5—5.5 mm, variable in shape and size, rounded to caudate, ciliolate, pubescent or sparsely so on both sides or only inside sometimes glabrous, with one row of 4—7 colleters at the base; colleters variable in shape and size, 0.1—0.5 x 0.1—0.4 mm, when wide lobed. *Corolla* white, with tube often partly greenish and/or reddish, sometimes greenish or yellowish in the throat, pubescent or sparsely so outside, occasionally partly glabrous on tube, pubescent to sparsely puberulous inside on lobes, glabrous or sometimes with pubescent stripes from the insertion of the stamens to the mouth; tube 2.3—7 x as long as the calyx, 1.8—3.2 x as long as the lobes, 25—50 mm long, 1—2 mm wide at the base and almost cylindrical for 0.4—0.6 of the length which is for 11—32 mm, abruptly widened above to 3—7 mm wide, gradually narrowed towards the throat to 2—5 mm wide and slightly widened at the mouth; limb spreading, with lobes almost free; lobes 0.3—0.55 x as long as the tube, 1.3—2.4 x as long as wide, 10—33 x 5—16 mm, ovate or elliptic, acute or acuminate, often crenate. *Stamens* with apex 1—13 mm below mouth of corolla tube, inserted at 0.4—0.7 of the length of the corolla tube (at 13—34 mm from the base); anthers 5—6 x as long as wide, 7.5—9 x 1.3—1.5 mm, apex sterile for 0.5—1 mm, fertile below for 3.5—4 mm; connective pubescent. *Pistil*: ovary cylindrical, 1—2 x 1—2 x 0.8—1.5 mm, retuse, pubescent except for the glabrous base; disk slightly lower to slightly higher than the ovary, 1—1.7 mm high; style rather slender, glabrous; pistil head of 4 parts, first a basal ring 0.6—0.7 mm wide, a cylinder which may be narrower in the middle, 1.2—1.5 x 0.3—0.5 mm, again a ring 0.4—0.5 mm wide and a stigmoid apex 0.2—0.5 x 0.1—0.2 mm. Ovules approximately 50 in each carpel. *Fruit*: follicles 5—18 x 0.5—1 cm, glabrous or pubescent. *Seed* 6—6.5 x 1.2 x 0.5 mm; embryo 5.2 mm long; cotyledons 4.2 x 1.4 mm; rootlet 1 x 0.5 mm; coma about 3 x as long as grain, 25 mm long.

Distribution: Endemic to Madagascar.

Ecology: Semideciduous forest, often with *Didieraceae* or woodland, often near base of rocky hills. Alt. 0—1200 m.

Geographical selection of the approximately 300 specimens examined:

Madagascar. Mahajanga: Miandrivazo, SF 6303 (P, TEF); Andriambe, Bekopaka, SF 3-R-286 (P); Masoarivo, *Leandri* 528 (NY, P); Bemaraha Mts, *Leandri* 120 (BM, C, P, TAN); Tsimambo Forest, SF 8243 (P, TEF, WAG); Ambereny Forest, Antsalova, *Rakotozafy* 1029 (TAN); Tsiampihy Forest, near Besaraha, *Leandri* 371 (K, P, US), 2225 (P, WAG); Ankinana, *Leandri* 990 (P); near Maintirano, *Decary* 8273 (P, W); *ibid.*, Ambararatakely, SF 25049 (P, TEF); near Morafenobe, *Decary* 2288 (P), 2298 (P), 2318 (P), 2326 (P); *ibid.*, SF 15145 (P, TEF, WAG); Ambodiroka, Maevatanana, *Descoings* 3302 (TAN); Belambo Forest, 5 km S of Maevatanana, *Dorr et al.* 3749 (BR, K, P, TAN, US, WAG); Besafotra R. basin, between Menavava and Ikopa Rs., *Perrier de la Bâthie* 420 ter (P); Besalampy-Maintirano Road, *Morat* 983 (TAN); near Betsiboka, *Capuron* SF 153 (P, TEF); Tsitampiky (= Sitampiky), *Decary* 8188 (P); Ankarafantsika Reserve, *Decary* 12809 (L, NY, P); Analamitsangana, Ankijabe, SF 14904 (P, TEF, WAG); Ambato-Boeni, *Perrier de la Bâthie* 11313 (P); near Bekodoka, *Decary* 8260 (P); Besalampy, *Decary* 15570 (P, WAG), 15660 (P, WAG); *ibid.*, Andranomavety, SF 6262 (P, TEF, WAG); Amborometroka, SF 21622 (BR, P, TEF, WAG); Namoroka Reserve, *Rakotovo* RN 3891 (P, TAN), 5088 (P, WAG); Mahabo, SF 13274 (P, TEF); Komehevitra, SF 3988 (P, TAN, TEF); Ankarafantsika Reserve, SF 69 (P), 70 (GB, P); *ibid.*, Ampijoroa, *Phillipson* 1930 (BR, K, TAN, WAG); Tsaramandroso, SF 4945 (P, TAN, TEF); Maevarano, SF 3125 (P, TAN, TEF); Boina, *Perrier de la Bâthie* 8955 (P); *ibid.*, upper Bemarivo R., *Perrier de la Bâthie* 8956 (P); Betsiboka R., *Perrier de la Bâthie* 420 (P, lectotype of *M. velutina*); Soalala-Mitsinjo Road, SF 4020 (P, TEF); Madirokely, Marovoay, *Bosser* 8440 (P); Sambirano, Soalala, SF 4315 (P, TEF); Mitsinjo, SF 4025 (P, TEF); *ibid.*, Masofandroboaka, SF 19489 (P, TEF); Bevazaha, *Ramamonjisoa* RN 1661 (BR, K, P, WAG); Imonty, Ankazoabo, SF 4138 (P, TEF); Ampagony, *Peltier* 5386 (P); Boanamaray, *Descoings* 3563 (P, TAN); *ibid.*, *Peltier* 5249 (P, WAG); Bombetoka Bay, *Bojer* s.n. (G-DC, P, lectotype); *ibid.*, *Richard* 528 (P); near Beronono, *Boiteau* 1054 (P, WAG); near Mandritsara, *Bosser* 16663 (P); Mahajanga, *Afzelius* 7 April 1912 (K, UPS); *ibid.*, SF 1846 (P, TEF); 2 km E of Mahajanga, *Leeuwenberg & Rapanarivo* 14685 (BR, MO, P, TAN, WAG); 6 km N of Mahajanga, *Leeuwenberg & Rapanarivo* 14690 (BR, MO, P, TAN, WAG); Bongolava, N of Mahajanga, *Morat* 2662 (P, TAN); Ampakobe, Port-Berge, SF 5874 (P); Antsahanira, *Rakotozafy* 1861 (TAN); Analamena Forest, Andranomena, SF 19664 (P, TEF); Mamoia Forest, Tsarahonena, SF 16405 (P, TEF); Misorobe Forest, Analalava, SF 89-R-78 (P); km 33 Ankarika-Analalava, *Leeuwenberg & Rapanarivo* 14738 (BR, MO, P, TAN, WAG); 7 km SW of Ambalafamainty, *Leeuwenberg & Rapanarivo* 14715 (BR, MO, P, TAN, WAG); Maromandia, *Decary* 1202 (P). Antsiranana: Nosy Be, *Decary* 8249 (C, P); *ibid.*, *Richard* 307 (G-DC, L, P, paratype). Antananarivo: Ankazobo District, *Geay* 5983 (P, type of *M. kidroa*), 5985 (K, P), 5986 (P); Tsiroamandidy, *Cat* 1114 (P); Mangarivo, *Grevé* 41 (K, P, TAN, US); Antsirabe, *Poisson* 616 (TAN). Toamasina: Antongil Bay, *Boivin* s.n. (P); Andilamena-Miarinarivo Road, *Bosser* 16669 (P, TAN); Andilameno, Miarinarivo, *Morat* 226 (TAN); Ampenefanevohe, *Bosser* 8100 (TAN). Fianarantsoa: Mania R. basin, *Perrier de la Bâthie* 12552 (K, P, TAN, type of *M. perrieri*); W of Itremo, *Humbert* 30018 (K, P, WAG); between Mandosonoro and Amborompotsy, *Morat* 4172 (P); Fianarantsoa, SF 2135 (P, TAN, TEF); Ankafina, *Deans Cowan* anno 1880 (BM, P); Ankaramena, SF 10537 (P, TEF); Ambalavao, Teteza, SF19-R-239 (P); Andringitra Reserve, *Dorr* 3926 (BR, K, P, S, TAN, US, WAG); *ibid.*, *Rakoto* RN 5831 (P); 35 km S of Ambalavao, along nat. road 7, *Miller &*

Randrianasolo 6267 (K); km 65 Ambalavao-Ihosy Road, 15 km N of Voatavo, *Leeuwenberg & Rapanarivo* 14638 (BR, MO, P, TAN, WAG); W of Ambalavao, *Croat* 30348 (K, P, TAN, WAG); landranbaky, S of Ambalavao, *Bernardi* 11144 (A, BR, E, FT, G, L, NY, P); near Zazafotsy, *Keraudren* 308 (P), 320 (P); *ibid.*, *Labat et al.* 2446 (P); *ibid.*, Ambahatoazo, *Peltier* 1243 (P, WAG); Masoala, Vohitsaoka, *Razafindrakoto* RN 2293 (P, TAN); Ihosy, *Peltier* 2740 (P, TAN, WAG); 1 km S of Ihosy, near Ihosy R., *Leeuwenberg & Rapanarivo* 14633 (BR, MO, P, TAN, WAG); Menarahaka R. valley, between Ihosy and Ivohibe, *Leandri & Rakoto* 3468 (K, P, WAG); near Ivohibe, *Armand* 85 (P); Ihosy-Analalivry Road, towards Sakasoa, *Allorge & Veyret* 594 (P); Iantara R. valley, Ivohibe, SF 1460 (P, TAN, TEF); Ihorombe, *Catut* 4348 (P, type of *M. pallida*); Lohony, Farafangana, *Rakotovaio* RN 7660 (P); northern part of Isaloa Mts, *Humbert* 19539 (BR, K, P, WAG); Isaloa Mts, *Cours* 5024 (P, TAN, WAG); *ibid.*, *Decary* 16337 (P, WAG); *ibid.*, Ranohira, *Schlieben* 8219 (B, BM, BR, HBG, K, M, TAN, Z), 8220 (B, BM, BR, HBG, K, M, P, TAN, UC, Z), 8242 (B, BM, BR, HBG, K, M, P, TAN, UC, Z); W of Ranohira, *Capuron* SF 18576 (P, TEF, WAG); ca 10 km SW of Ranohira, *Dorr et al.* 4181 (BR, P, TAN, WAG); S of km 11 Ranohira-Sakaraha Road, *Leeuwenberg & Rapanarivo* 14614 (BR, MO, P, TAN, WAG), 14621 (BR, MO, P, TAN, WAG); Ampandrabe, SF 31425 (TEF); Col de Tapia, 59 km E of Sakaraha, *Croat* 30617 (P, TAN, WAG); *ibid.*, *Capuron* SF 20244 (K, P, TEF, WAG); Ilalaka, Isalo, *Peltier* 2984 (P), 5789 (P); *ibid.*, SF 14840 (P, TEF); Lombomakondro, *Perrier de la Bâthie* 18591 (P); Benonoka, SF 31695 (TEF). Toliara: Mendoravy, SF 26480 (P, TEF); Fort-Dauphin, *Decary* 4105 (P), 4312 (P), 4319 (P); *ibid.*, *Scott Elliot* 2373 (K, P, *M. sessilifolia* Dubard in syn. of *M. arborescens* in Bull. Soc. Bot. Fr. 53: 295 (1906)); Manavy, Ambovombe, SF 9567 (P, TEF, WAG); Andohahela Reserve, *Rakotoniana* RN 3461 (P, TAN, WAG), 6213 (P, WAG); *ibid.*, Parcelle 1, *Randriamampionona* 85 (TAN, WAG); Parcelle 2, *Leeuwenberg* 14170 (BR, K, P, TAN, WAG); Parcelle 3, *Leeuwenberg* 14183 (BR, K, P, TAN, WAG); *ibid.*, *Randriamampionona* 121 (TAN, WAG), 273 (TAN, WAG); upper Mandrare R. valley, *Humbert* 6488 (B, NY, P, US, WAG); Lavanala For., *Grandidier* Oct. 1869 (P); Filanjora, Mahabo, SF 12856 (P, TEF, WAG); Ejeda, *B. Du Puy* MB 42 (TAN); near Anadabolava Forest, middle Mandrare R., *Keraudren* 1548 (P, WAG); Ambovombe District, *Decary* 2824 (P); between Tsivory and Anadabolava, *Humbert* 12333 (P); upper Onilahy R. basin, Andranomiforitra R. valley, *Humbert* 7050 (P); Malio R. basin, tributary of Mangoky R., near Ambalabe, *Humbert* 19385 (BR, K, P, WAG); Betroka, SF 8396 (P, TEF); Vohipolaka Mt, N of Betroka, *Humbert* 11651 (P); Antanimora, *Decary* 3323 (P); Beloha-Tranoroa Road, *Keraudren* 921 (P, WAG); Bevoay, near Beraketa, *Peltier* 2897 (P, TAN, WAG); Ampandrandava, *Seyrig* 21 (P); Bekely, SF 9663 (P, TEF, WAG); Ankilivalo, S of Berenty-Betsiko, Ankazoabo, *Morat* 2522 (P); Zombitsy For., *Willing* 36 (TAN); Betroka, Herb. Jard. Bot. Tana. 4989 (TAN); near Morondava, Menabe, Exp. Colon. Marseille s.n. (P); Malaimbandy, *Morat* 69 (P, TAN); between Malaimbandy and Ankilizato, *Keraudren-Aymonin & Aymonin* 25831 (P, WAG); Dabolava, *Decary* 15223 (P); Ankazomanja, *Decary* 15274 (P), 15277 (P); Ambatakazo, Miandrivazo District, *Decary* 15257 (L, P); Beraboka Forest, Miandrivazo District, SF 17825 (P, TEF); Ampasimandroatse Forest, Belo-Tsiribihina, SF 54-R-247 (P); Morondava, *Grevé* 204 (K, P, S, TAN, WAG, lectotype of *M. humblotii*); *ibid.*, Anjenanja, SF 12245 (P, TEF, WAG); Manja, *Rauh* 898 (TAN); Ankilizato, *Bosser* 4591 (TAN); Betoboro, Befasy, SF 16554 (P, TEF); between Morondava and Bemaraha Mts southern base hills, *Humbert* 11367 bis (P); W of Ankilizato, *Keraudren-Aymonin & Aymonin* 25969 (P, WAG); Beroroho Road, *Morat* 2463 (P, TAN); between Antanimieva and

Befandriana, *Poisson* 635 (P); Beravy Mts, *Hildebrandt* 3099 (BM, K, P, W); upper Fiheranana R. basin, *Perrier de la Bâthie* 16604 (P); Lambomakandro Forest, E of Sakaraha, *Capuron* SF 548 (P, TEF); Zombitsy Forest, *Bosser* 13862 (P, TAN), 13947 (P, TAN), 13981 (P, TAN); km 18 Sakaraha-Ihosy Road, *Miller & Keating* 4526 (K, P, TAN, WAG); near Fanjahira, *Humbert* 2745 (P); Onilahy R. valley, near Tongobory, *Humbert* 2733 (P, TAN); Hazoroa, Tulear, SF 3396 (P, TAN, TEF); Taheza R., *Geay* 6003 (BM), 6004 (P), 6005 (K), 6006 (TAN), 6007 (P, type of *M. geayi*); Beza Mahafahy Reserve, near Betioky, Parcelle 1, *Phillipson* 2640 (BR, C, K, P, TAN, WAG); Parcelle 2, *Phillipson* 1828 (P, TAN); Mahafaly Plateau, near Itampolo, *Perrier de la Bâthie* 4407 bis (P); E of Ampotaka, *Geay* 6345 (P). Sin. loc.: *Baron* 92 (K, P, type of *M. macrocalyx*), 4562 (K, P), 4575 (E, K, P, type of *M. tenuifolia*), 4716 (BM, K, P, type of *M. lisianthiflora* var. *baronica*), 5787 (K, P, type of *M. l.* var. *pubescens*), 6769 (K), 6874 (K), 6869 (K), s.n. (= 92 ?) (P, type of *M. l.* var. *hybrida*); *Commerson* s.n. (C, P, P-JU, paratype of *M. l.* var. *pubescens*); *Grevé* 100 (K, P, TAN, WAG, type of *M. phyllocalyx*); *Humboldt* 204 (P, WAG, type of *M. humblotii*); *Richard* 239 (FI-W, TCD), 284 (P), 845 (P).

Cultivated. U. S. A.: Florida, Subtrop. Hort. Research Station, Miami, *Avery* 1585 (USF); Plant Introduction Station, Miami, *Gillis* 9453 (P). Madagascar: *Bojer* anno 1833 (G-DC, paratype); Tsimbazaza Park, Antananarivo, *Rakoto* RN 1769 (P). Réunion, Botanic Garden, *Pierre* 244 (P). Mauritius: *Ayres* s.n. (GH); *Bojer* s.n. (K). India: Botanic Garden Calcutta, anonym. s.n. (L, P) and *Pierre* 3584, April 1863 (P).

Notes. The leaves of the lectotype and paratype of *M. lisianthiflora* are 6—14 x 3—5 cm, subcoriaceous and acuminate, and they have conspicuous tertiary venation. Those of the type of *M. perrieri* are 1.5—4.5 x 0.5—1.4 cm, coriaceous and obtuse or rounded and they have invisible tertiary venation. The flowers of the latter are similar in most details, but they are less hairy. Intermediates between these two and the other forms kept together here exist without any correlation between the differentiating characters. A good series to show why *M. perrieri* is not kept up as a species has been collected by *Schlieben* at Ranohira in the Isalo Mts, 8242 with the same leaves as the type of *M. perrieri* but more hairy all over, 8220 perfectly intermediate, first named *M. lisianthiflora* and later changed by Markgraf to *M. perrieri*, and finally 8219 a perfect *M. lisianthiflora* of which only the leaves are smaller than those of its type. The range of leaf sizes is 1.5—12 x 0.5—7 cm.

3. 5. *M. macrosiphon* Bak. in Journ. Linn. Soc. Bot. 22: 504 (1887); Markgraf, op. cit. 260, pl. 43, 5—6. — Type: Central Madagascar, sin. loc., *Baron* 3840 (holotype K; isotypes BM, P).

Fig.4, p. 26; map 6, p. 36

Heterotypic synonym: *M. mangorensis* Jum. & Perr. in Agric. prat pays chauds 12: 433 (1912). — Type: Madagascar, Toamasina, upper Anosivola R., tributary right bank of Mangoro R., Perrier de la Bâthie 18625 (lectotype P, designated here).

Shrub or tree 5–10 m high. Branches pale or dark grey-brown, lenticellate; branchlets puberulous. *Leaves*: petiole puberulous or glabrous, 2–6 mm long; blade subcoriaceous when dried, elliptic or obovate, 1.5–3.5 x as long as wide, 2–5.5 x 1–2.5 cm, rounded to shortly acuminate with a blunt acumen at the apex, cuneate at the base, margin often revolute, with a few minute hairs on the costa beneath or entirely glabrous, with 4–10 pairs of rather obscure and rather straight secondary veins forming an angle of 45–60° with the costa; tertiary venation not or hardly visible. *Inflorescence* 1–2-flowered. Peduncle 0–2 mm long, puberulous or glabrous; pedicels 3–12 mm long, puberulous or glabrous. Bracts sepal-like, about half as long as them. *Flowers*: *Sepals* green or reddish outside, erect or nearly so, ovate or triangular, 0.7–2.3 x as long as wide, 1.5–3.5 x 1.3–1.5 mm, acute, ciliolate, sparsely puberulous to glabrous outside, glabrous inside and with 1–2 colleters at the edge of each sepal (5–10 in a flower); colleters 0.2 x 0.2 mm. *Corolla* white, partly puberulous outside all over to only on the lobes and in stripes on upper part of tube, pilose inside often(?) in stripes from the base to the insertion of the stamens and from the apices of the anthers to the mouth, pubescent on the lobes; tube 10–23 x as long as the calyx, 2–2.6 x as long as the lobes, 26–37 mm long, 2 mm wide above the base, abruptly widened 0.3–0.4 of the length from the base which is 10–11 mm from there to 3–5 mm wide, again narrowed gradually towards the mouth to 1.5–2 mm wide, widened at the mouth to 5 mm wide; limb spreading, with lobes almost free; lobes ovate or nearly so, 0.4–0.5 x as long as the tube, 1.2–2 x as long as wide, 10–17 x 6–8 mm, acuminate. *Stamens* with apex 9–17 mm below mouth of corolla tube, inserted 0.35–0.43 of the length of the corolla tube (at 13–14 mm from the base); anthers 4–5 x as long as wide, 6–8 x 1.5–2 mm, apex sterile for 1–1.5 mm, fertile below for about half of the remaining part. *Pistil*: ovary cylindrical, 1.5 x 1.5 x 1 mm, retuse at the apex, pubescent except for the part covered by the disk; disk 0.5 mm high; style rather slender, pilose; pistil head of a basal entire veil 0.5 x 1 mm and a stigmoid apex 1 x 0.5 mm.

Ovules approximately 30 in each carpel. *Fruit*: follicles linear, 20 x 0.5 cm.

Distribution: Eastern Madagascar.

Ecology: Forest understorey. Alt. up to 1150 m.

Specimens examined:

Madagascar. Antsiranana: Beanajada Mts, N of Masoala Peninsula, *Capuron* SF 8810 (B, G, K, P, TAN, TEF). Toamasina: Analamazaotra Forest, *Louvel* 9 (P); *ibid.*, *Ramanantoavolana* in *Thouvenot* 97 (K, P, paratype of *M. mangorensis*); W of Antanandava, km 45 Moramanga-Anosibe Road, *Capuron* SF 28431 (G, K, P, TEF); Ankazomanitra, Anosibe, SF 26832 (P, TEF, WAG); upper Anosivola R., tributary right bank Mangoro R., *Perrier de la Bâthie* 18625 (P, lectotype of *M. mangorensis*). Fianarantsoa: Ranomafana Reserve, *Rakoto* 292 (P, TAN, WAG), 341 (P, TAN, WAG); *ibid.*, *Turk & Randrianasolo* 582 (P, TAN, WAG). Sin. loc.: *Baron* 3840 (BM, K, P, type).

3. 6. *Mascarenhasia rubra* Jum. & Perr. in *Ann. Mus. Colon. Marseille* III, 6: 19 (1918); Markgraf, *Fl. Madag. Fam.* 169: 274, pl. 46, 5 (1976). — Type: Madagascar, Antsiranana, Masoala Mts, near Marambo, *Perrier de la Bâthie* 18627 (holotype P).

Fig. 6, p. 39; map 4, p. 27

Shrub or small tree. Branches pale brown; branchlets glabrous. *Leaves*: petiole 3–10 mm long; blade coriaceous when dried, elliptic, 2.5–3.5 x as long as wide, 10–15 x 3–5.5 cm, acuminate at the apex, cuneate at the base, margin revolute, glabrous on both sides, with 8–9 pairs of upcurved secondary veins forming an angle of 50–80° with the costa; tertiary venation invisible. *Inflorescence* probably 3-flowered. Peduncle 3 mm long, glabrous; pedicels 12 mm long, glabrous. *Flowers*: *Sepals* green(?), oblong, 8–11 x 2 mm, obtuse, glabrous on both sides, with colleters(?). *Corolla* red, puberulous outside on apex of tube and on lobes, with stripes of pubescence inside from the insertion of the stamens to the mouth and pubescent on the lobes; tube at least 33 mm long, above the base 2 mm wide and cylindrical for 12 mm, abruptly widened to at least 5 mm wide. Stamens deeply included; anthers 9 mm long, glabrous. *Fruit*: follicles 22 x 0.5 cm (only one known on type), as those of *M. arborescens*.

Distribution: Only known from the type.

Ecology: Forest understorey.

Note. It is possible, that some of the fruiting specimens named *M. arborescens*, which do not flower at the same time, belong to *M. rubra*.

3. 7. **Mascarenhasia speciosa** Scott-Elliot in Journ. Linn. Soc. Bot. 29: 32 (1891); Markgraf, Fl. Madag. Fam. 169: 264, pl. 44, 5-8 (1976). — Type: Madagascar, Fianarantsoa, Vangaindrano, *Scott-Elliot* 2177 (lectotype K, designated here, cited as holotype by Markgraf; isoelectotypes BM, E, P). Fig. 5, p. 35; map 4, p. 27

Heterotypic synonym: *M. speciosa* var. *dextra* Dubard in Bull. Soc. Bot. Fr. 53: 256 (1906). — Type: Madagascar, Toliara, Fort-Dauphin, *Cloisel* 66 (holotype P; isotype BM).

Shrub or small tree, 0.50–7 m high, with clear sap in all parts. Branches dark brown, obscurely lenticellate; branchlets puberulous or glabrous. *Leaves*: petiole 1–5 mm long, puberulous or glabrous; blade subcoriaceous when dried, elliptic, 1.5–3.5 x as long as wide, 1.5–6 x 0.9–2.5 cm, caudate to apiculate at the apex with a blunt acumen, cuneate or rounded at the base, glabrous on both sides or puberulous on base of costa beneath; secondary and tertiary venation inconspicuous. *Flowers* solitary. Peduncle 10–25 mm long, glabrous. Bracteoles minute, scale-like, near base of peduncle. *Sepals* green(?) or red (teste *Cloisel* 66 and 79), suberect in dried flowers, obliquely ovate or elliptic, 2–3 x as long as wide, 5–12 x 2.5–5 mm, obtuse or acuminate with a blunt acumen, ciliolate or not, sparsely puberulous to glabrous on both sides, with 2–5 colleters at the base; colleters in groups of 2–3 at the edge of the sepals or in a continuous row, 0.2–0.4 x 0.1–0.4 mm, often lobed when large. *Corolla* entirely white or with tube and part of lobes not covered in bud red or pink outside and white on remaining part of lobes and inside, puberulous outside on the in bud covered part of the lobes, otherwise glabrous, glabrous inside in tube and puberulous on lobes, usually in a central longitudinal line; tube 4–11 x as long as the calyx, 4–6.5 x as long as the lobes, 45–60 mm long, funnel-shaped, basal part cylindrical, 0.6–0.7 of the tube length, 34–43 x 1.5–2.5 mm, gradually widened to 4–6 mm wide 2–5 mm above, at the level where the stamens are inserted, 12–20 mm wide at the mouth; lobes spreading, broadly ovate or nearly so, 0.16–0.22 x as long as the tube, 0.5–1.1 x as long as wide, apiculate. *Stamens* with apex

0—9 mm below mouth of corolla tube, often exerted in dried flowers, inserted 0.7—0.85 of the length of the corolla tube (at 36—49 mm from the base); anthers 4—6 x as long as wide, 8—9 x 1.5—2 mm, apex sterile for 0.5—1 mm, remaining part fertile for upper half or slightly more, again sterile below; connective pubescent to glabrous. *Pistil*: ovary ovoid, 1.5—2 x 1.5—2 x 1—1.3 mm, gradually narrowed into the style or obtuse, glabrous; disk lower than ovary, 0.5—1.2 mm high; style slender, from pilose at the base to pubescent at the apex; pistil head of a basal veil about 0.5 x 1 mm and a stigmatic apex about 1.5 x 0.5 mm. Ovules approximately 40 in each carpel. *Fruit*: follicles 27—50 x 0.4 cm, with a thin wall. *Seed* grain 8.5—9 x 1.5 x 0.5 mm; embryo almost filling the seed; coma about twice as long as the grain.

Distribution: Endemic to southeastern Madagascar.

Ecology: Dry forest or bush. Alt. 0—100 m.

Geographical selection of the 35 specimens examined:

Madagascar. Toamasina: Manampotsy R., SW of Vatomandry, *Perrier de la Bâthie* 14139 (P). Fianarantsoa: S of Vangaindrano, *Scott Elliot* 2155 (K, P, paratype), 2177 (BM, E, K, P, lectotype). Toliara: near Manantenina, *Humbert* 20435 (P, WAG); N of Fort-Dauphin, towards Belavenoka, *Decary* 1732 (P); Tsingafiafy Forest, between Manambato and Fitamalama Rs., *Capuron* SF 28681 (BR, K, P, TEF, WAG); Bemangidy Forest, N of Mahatalaky, *Capuron* SF 11791 (BR, K, P, TEF, WAG); Ste. Luce, *Dumetz* 1201 (BR, K, P, WAG); 44 km N of Fort-Dauphin, along road to Ste. Luce (Manafiafy), *Phillipson et al.* 3954 (TAN, WAG); N of Antorendrika R., *Gereau et al.* 3313 (BR, K, P, TAN, WAG); Manantantely Forest, *Humbert* 5804 (G, L, P, TAN, US, WAG), 20354 (BR, K, P, WAG); *ibid.*, *Rabevohitra* 2423 (P, TAN, TEF, WAG); Mandena Forest, *Dumetz et al.* 585 (BR, K, P, TAN, TEF, WAG); *ibid.*, *Rabevohitra* 2203 (K, P, TAN, TEF, WAG); Fort-Dauphin, *Cloisel* 66 (BM, P, type of *M. speciosa* var. *dextra*), 79 (BM, P); *ibid.*, *Decary* 4166 (BM, K, P, US); near Vinanibe, SW of Fort-Dauphin, *Capuron* SF 11760 (K, P, WAG), 20521 (P, TEF, WAG); Italy Road, *Bosser* 15840 (P, TAN).

3. 8. *Mascarenhasia tampinensis* Pichon in Not. Syst. ed. *Humbert* 13: 211 (1948); Markgraf, Fl. Madag. Fam. 169: 274, pl. 46, 1—4 (1976). — Type: Madagascar, Toamasina, Tampina, *Ursch* 55 (holotype P). Fig. 6, p. 39; map 4, p. 27

Shrub or small tree. Branches medium grey, lenticellate; branchlets glabrous or minutely puberulous. *Leaves*: petiole 1—5 mm long, glabrous; blade coriaceous when dried, elliptic or narrowly so, 2.5—5 x as long as wide, 3—6 x 0.8—2.2 cm,

acuminate to obtuse at the apex, cuneate at the base, glabrous on both sides, with 4—7 pairs of obscure secondary veins; tertiary venation inconspicuous. *Flowers* solitary. Peduncle 7—12 mm long, glabrous, with 1—2 bracteoles at the base. Bracteoles sepal-like and 0.3—0.5 x as long as them. *Sepals* green(?), erect, oblong or nearly so, 3—4.5 x as long as wide, 6—9 x 2—2.5 mm, obtuse, not ciliolate, glabrous on both sides, with 10 colleters inside in one row at the base; colleters 0.2 x 0.1 mm. *Corolla* tube and part of lobes not covered in bud red, remaining part of lobes and inside white, puberulous outside all over, only on the lobes or even only on the part of the lobes covered in bud, pubescent inside on lobes and pilose in upper 1 cm of tube, otherwise glabrous; tube 6.5—9 x as long as the calyx, 2.6—3 x as long as the lobes, 35—60 mm long, above the base 2 mm wide, abruptly widened at 0.14—0.2 of the tube length which is at 7—10 mm into a campanulate or narrowly urceolate part which is 8—14 mm wide above its base and mostly narrowed at the throat to 8—11 mm wide, again widened at the mouth; lobes spreading, ovate or nearly so, 0.25—0.3 x as long as the tube, 1.3—2.6 x as long as wide, 12—21 x 8—15 mm, apiculate. *Stamens* deeply included, inserted just above the widening of the tube; anthers 4.5—4.8 x as long as wide, 9—12 x 2—2.5 mm, apex sterile for 1—2 mm, fertile for one half of the remaining part and again sterile below; connective pubescent. *Pistil*: ovary ovoid, 2.5—3 x 1.5—2 x 1—1.2 mm, obtuse, glabrous; disk lower than ovary 1.2—1.5 mm high. *Fruit* unknown.

Distribution: Eastern Madagascar.

Ecology: Forest understorey, near river banks. Alt. 0—4 m.

Specimens examined:

Madagascar. Toamasina: Tampina Forest, *Ursch* 55 (P, type); Ambila-Lemaitso, SF 1109 (P, TAN, TEF), 1130 (P), 6326 (P, TEF); *ibid.*, Ambodivily Forest, *Rakotosihanaka* RN 19 Jan. 1949 (P, TAN); *ibid.*, *Randrianasolo* RN 5, 24 Jan. 1949 (P, TAN); *ibid.*, SF 2926 (P, TAN, TEF, WAG).

Species excluded from *Mascarenhasia*

Mascarenhasia curnowiana Hort. in M.T. Masters (ed.) in Gard. Chron. II, 16: 283 (1881), as *Mascarenhaisia*. — Type: Cult., seeds from Madagascar, (holotype K) = *Alafia thouarsii* Roem. & Schult.

M. gerrardiana Bak. in Journ. Linn. Soc. Bot. 22: 504 (1887). — Type: Madagascar, sin. loc., *Baron* 4652 (lectotype K, designated here) = *Alafia thouarsii* Roem. & Schult.

4. **Petchia** Livera in Ann. Roy. Bot. Gard. Peradeniya 10: 140 (1926); H. Huber in Abeywickrama (ed.), Flora of Ceylon 1. 1: 16 (1973). — Type species: *P. ceylanica* (Wight) Livera.

Heterotypic synonym: *Caubucala* Pichon in Not. Syst. ed. Humbert 13: 202 (1948); Markgraf, Fl. Mad. fam. 169: 61 (1976), **syn. nov.** — Type species: *C. madagascariensis* (A. DC.) Pichon (= *Petchia madagascariensis* (A. DC.) Leeuwenb.).

Shrubs or small trees with white latex (latex not mentioned with *P. humbertii* and *P. plectaneifolia*), glabrous all over except for the sometimes ciliate sepals and corollas inside. Branches with concolourous lenticels; branchlets terete. *Leaves* at least on some branches, especially where they ramify in whorls of 3—5, otherwise opposite, only in *P. africana* all opposite, petiolate; blade variously shaped, entire. *Inflorescences* terminal and often also axillary (see note). *Sepals* connate at the extreme base, subequal, clasping the corolla base or only in dried flowers often more or less spreading, ovate or nearly so, mostly obtuse or rounded, rarely ciliate, without colleters. *Corolla* white, pale yellow or salmon, pubescent at the base of the lobes (rarely not in *P. cryptophlebia*), with a callous ring at the mouth, glabrous from the mouth to the insertion of the stamens or pilose in *P. plectaneifolia* and sometimes in *P. cryptophlebia*, with a pilose belt below the insertion of the stamens which is more sparse towards the base, not ciliate on lobes; tube mostly narrowly cylindrical, widened around the anthers which is close to the mouth, slightly contracted at the mouth; lobes overlapping to the left in bud, often oblique, ovate, elliptic, oblong or narrowly so, rounded or obtuse, entire, spreading, often recurved later. *Stamens* mostly with apex about 0.5 mm below mouth of corolla tube; filaments very short; anthers ovate or nearly so, entirely fertile, acuminate or apiculate at the apex, cordate at the base. *Pistil* with apex mostly about halfway along anthers, sometimes below or above; ovary narrowly ovoid, mostly laterally compressed, usually gradually narrowed into the filiform style, of 2 separate carpels; disk absent; pistil head usually of 4 parts of which the first and the third may be absent, a basal ring, a globe or cylinder, again a similar ring and a bilobed stigmatic apex. Ovules in 2 rows of up to 13 in each carpel. *Fruit* orange or red, of 2 separate moniliform or torulose follicles which contain each a single series of 1—13 drupes; exocarp thin; mesocarp fleshy or pulpy; drupe ellipsoid, laterally compressed, lumpy. *Seed* one, with a thin smooth testa; endosperm mealy, not ruminant,

surrounding the embryo; embryo straight, spatulate; cotyledons elliptic, rounded at the apex and at the base, about as long as the rootlet.

Petchia counts 8 species, one of which is endemic to Sri Lanka, 5 are endemic to Madagascar, one is endemic to Madagascar and the Comoro Islands and one to Cameroun.

Notes. When monographing *Cabucala* Pichon the present author compared it with *Alyxia* from which it had been separated by Pichon. His conclusion could be corroborated by the field studies carried out for this monograph. The small often shrub-like trees of *Petchia* (= *Cabucala*, as is explained below) have the model of Prévost as the author observed in the field in plants of *P. erythrocarpa*, *P. madagascariensis* and *P. montana* and in the herbarium of *P. plectaneifolia*. The tree top and the apex of each branch ramify in as many elements as they have leaves in most cases. An element is a branchlet or an inflorescence. Therefore when inflorescences are accompanied by branchlets they are axillary. When a whorl of branchlets (and inflorescences) is fully developed, a vigorous shoot starting from a lateral bud just below this whorl will overtop it in the form the continuation of the tree or the branches as is usual in the model of Prévost. *Alyxia* may have the model of Troll, as has been observed by the present author in passing by in the field, and should be verified.

Livera (1926) has described *Petchia*, which he founded on *Alyxia ceylanica*. Pichon could hardly distinguish his *Cabucala* (1948) from *Petchia*. Pichon gave a poor key (1949) to distinguish *Cabucala* from *Petchia* in which the only characters were the ratio of the sepals and the shape of the pistil head. The sepals range from 1.2 to 4.5 x as long as wide and not from 1.5 to 2 x in *Cabucala* and they are ca 2 x in *Petchia* and do not range from 3 to 3.5 x. The pistil head may have a basal veil, present in *Cabucala* and absent in *Petchia* (Pichon, 1949). The far richer collections available at the moment show that both possibilities are present in *Petchia ceylanica* and in several of the Madagascan species also this character was no longer distinctive. F.J.H. van Dilst (pers. comm.) observed in a single specimen of *Landolphia mytrifolia*, a Madagascan species, has the basal veil on the pistil head in a mature bud, while in open flowers it is lacking. The open flowers of *Leeuwenberg* et al. 14273 of *P. erythrocarpa* (preserved in liquid preservative) have the four

parts of the pistil head conform the generic description of *Petchia* (this paper), and has a far less developed veil in the bud. Therefore the shape of the pistil head only indicates the age of the flower and therefore has less taxonomic importance than was often supposed. As analyses carried out again on *Petchia ceylanica* showed that it is so closely allied to *Cabucala erythrocarpa* in all characters, that the present author is obliged to reduce *Cabucala* to a synonym of *Petchia*. Fortunately the present monograph exclusive of *P. ceylanica* was not yet published when it was discovered that *Petchia* and *Cabucala* were distinguished on too weak characters to keep them separate.

Key to the species of *Petchia*

1. Leaves abruptly narrowed at the apex into a linear tail; sepals narrowly ovate, acuminate. Cameroun.....**1. *P. africana***
 Leaves not abruptly narrowed if caudate; sepals ovate, obtuse or rounded. Madagascar; or acuminate, Sri Lanka.....**2**
2. Corolla tube 5—5.5 mm long. Mountains.....**5. *P. humbertii***
 Corolla tube 6.5—25 mm long. Lowland or mountains.....**3**
3. Leaves subcordate or rounded at the base, shortly petiolate, rounded to very shortly acuminate with a blunt acumen at the apex.....**3. *P. cryptophlebia***
 Leaves cuneate, or in some blades rounded at the base, never subcordate short- or long-petiolate, mostly acuminate at the apex.....**4**
4. Corolla tube 6.5—9 mm long (9-10 mm in 2. *P. ceylanica*).....**5**
 Corolla tube (11—)13—25 mm long.....**6**
5. Leaves small, 3—6 cm long, long-acuminate.....
**8. *P. plectaneiiifolia***
 Leaves mostly more than 8 cm long, if smaller, rounded or obtuse.....**6. *P. madagascariensis***
6. Montane shrub (alt. 1500—2000 m); leaves 1.5—5.5 cm long, obtuse or slightly acuminate; inflorescence few-flowered.....
**7. *P. montana***
 Lowland shrub or tree (alt. 0—600 m); leaves often larger, long-

acuminate to rounded; inflorescence few or many-flowered.....7

7. Leaves mostly herbaceous when fresh and membranaceous when dried, long-acuminate to caudate, if not clearly so, more than 5 x as long as wide and up to 1.2 cm wide; intersections of fruits mostly about 0.1—0.2 x as wide as compartments.....

.....4. ***P. erythrocarpa***

Leaves coriaceous even when fresh, rounded to acuminate, acumen never long, blade, if 5 x as long as wide, more than 2 cm wide; intersections of fruits 0.3—0.8 x as thick as compartments.....6. ***P. madagascariensis***

Notes. The flowers of the various species of *Petchia* are very similar. The only more or less useful key character is the length of the corolla tube. *P. madagascariensis* is very variable and closely allied to the less variable *P. erythrocarpa*. Specimens of which the leaves are up to 1.2 cm wide and more than 5 x as long as wide and not (as is the rule in the species) long-acuminate to caudate are considered here to belong to *P. erythrocarpa*. Specimens with large leaves rounded or obtuse at the apex and mostly cuneate at the base (at least in some blades of a specimen) are placed here in *P. madagascariensis*, while those with subcordate or rounded otherwise very similar leaves are placed here in *P. cryptophlebia*. The inconsequent annotations of both Pichon (1948) and Markgraf (1970, 1972) show that it is very difficult to distinguish most of the *Petchia* species from each other. *P. ceylanica* resembles *P. erythrocarpa* by the leaves, but is less variable in this character. The corolla is white in *P. ceylanica* and 9—10 mm long and pale yellow or salmon and 13—23 mm long in *P. erythrocarpa*.

4. 1. ***Petchia africana*** Leeuwenb., sp. nov.

Fig. 8, p. 57

Frutex slivae orae. Folia opposita anguste elliptica vel ovata apice abrupte attenuata cauda lineari utroque latere glabra. Inflorescentiae terminales pauciflorae pedunculis perbrevibus pedicellis multo brevioribus. Sepala viridia angustissime ovata longe acuminata utroque latere glabra eglandulosa. Corolla pallide flava extus glabra annulo oris calloso glabro intus infra insertionem staminum pilosa; tubus anguste cylindraceus fauce circa antheras

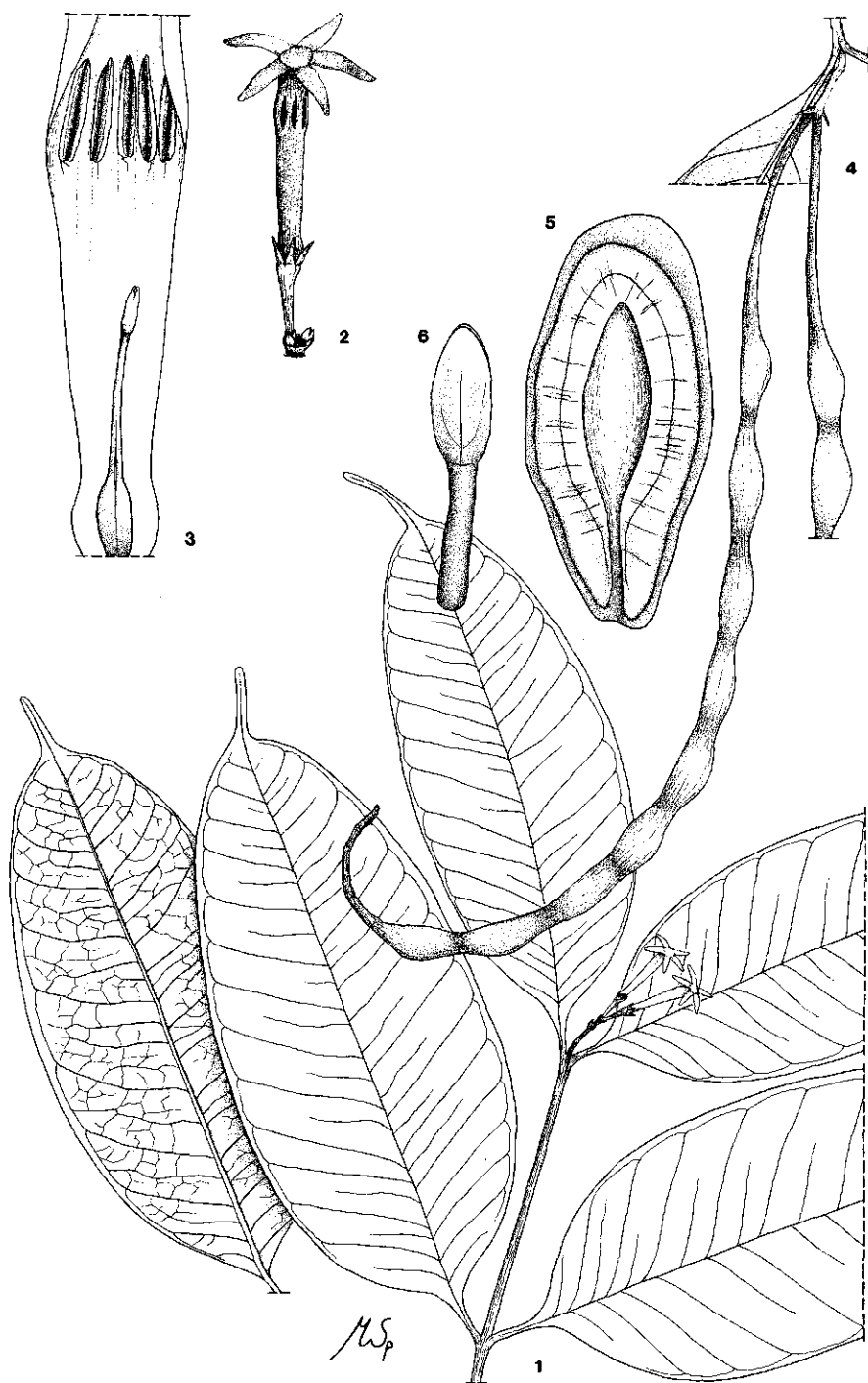


Fig. 8. *Petchia africana*. 1, habit (x 2/3); 2, flower (x 2); 3, opened flower (x 6); 4, fruit (x 2/3); 5, drupe on section (x 4); 6, embryo (x 4). 1—3 from W. de Wilde & B. de Wilde-Duyfjes 2901; 3—6 from W. de Wilde & B. de Wilde-Duyfjes 2902.

dilatatus; lobi oblique angusteque elliptici apice rotundati integri patentes. Stamina inclusa antheris anguste ovatis apice acuminatis basi cordatis omnino fertilibus glabris. Pistillum glabrum ovario anguste ovoideo carpellis duobus separatis stylo filiformi unico gradatim angustato; caput pistilli basi ellipsoidea stigmatica et apice stigmoidea parva bilobata. Fructus aurantiaci folliculi duo separati lineares torulosi basi stipitati apice caudati drupas circiter decem continentes. Paries drupae glebosa dura. Endospermium farinosum embryonem cingens. Embryo rectus spathulatus cotyledonibus ellipticis radícula aequilongis.

Typus: Cameroun, Centre-Sud, about 8 km N of Kribi, flowering, *W.J.J.O. de Wilde & B.E.E. de Wilde-Duyffjes* 2901 (holotype WAG).

Shrub 1.50–2.50 m high, with white latex, entirely glabrous except for the corolla tube inside. Branches green. *Leaves* opposite; petiole 6–10 mm long; blade papery when dried, narrowly elliptic or narrowly ovate, 2.5–3.2 x as long as wide, 14–21 x 4.5–7.5 cm, abruptly caudate at the apex, with a linear tail 10–20 mm long, cuneate at the base, with 12–20 pairs of rather straight secondary veins forming various angles with the costa; tertiary venation reticulate. *Inflorescences* terminal, 1–4 together, ca 2 x 2 cm, few-flowered. Peduncle very short, 0.5–1 mm long; pedicels 4 mm long. Bracts like the sepals and about 0.2 x as long as them. *Flowers*: *Sepals* green, narrowly to very narrowly ovate, 4–7 x as long as wide, 2–3.5 x 0.5 mm, long-acuminate, persistent even under the ripe fruit. *Corolla* pale yellow, with a pilose belt below the insertion of the stamens 5 mm wide; tube about 4 x as long as the calyx, 2.1–2.5 x as long as the lobes, 13–15 mm long, 2 mm wide at the base, 2.5 mm wide around the anthers, narrowed at the mouth to 2 mm wide; lobes elliptic, 0.4–0.45 x as long as the tube, twice as long as wide, 6 x 3 mm, rounded at the apex, spreading. *Stamens* with apex 1–2 mm below mouth of corolla tube, inserted 0.7 of the length of the corolla tube (at 9–10 mm from the base); filaments 0.5 mm long; anthers narrowly ovate, 5 x as long as wide, 3 x 0.6 mm. *Pistil* with apex about 2 mm below base of anthers (in tube of 15 mm long 7.5 mm long); ovary narrowly ovoid, laterally compressed, 2 x 1 x 0.7 mm, gradually narrowed into the filiform style; pistil head of a basal stigmatic ellipsoid part 1 x 0.3 mm and a bilobed stigmoid

apex 0.2 x 0.2 mm. *Fruit*: follicles orange, linear, 27 x 1 cm, torulose to almost moniliform, with stipe 5.5 cm long and a tail 4 cm long, with 9–11 drupes. Drupes ellipsoid, 16 x 5–6 x 4 mm, acute at both ends; wall 2 mm thick; embryo 12 mm long; cotyledons 6 x 2.5 mm; rootlet 6 x 0.7 mm.

Distribution: Only known from the the two unicates collected on the same locality on the same day.

Ecology: Understorey of coastal rain forest. Alt. 2 m.

Paratype:

Cameroun, *ibid.*, fruiting, W.J.J.O. de Wilde & B.E.E. de Wilde-Duyffes 2902 (WAG).

Notes. This species is the first of *Petchia* from the African continent. The genus was only known from Sri Lanka, Madagascar and the Comoro Islands until these specimens from Cameroun were recognized as belonging to *Petchia*. Although the collectors found the specimens already more than thirty years ago, on 8 August 1964, the material travelled through the herbarium until the author could assign it to the correct genus. The fruiting specimen was erroneously filed under *Malouetia* and the flowering one under *Hunteria*. They turned out not to belong there only when the monographers, respectively J. van der Ploeg (1984) and E. Omino-Achola (1995) discovered that they did not belong there. The conclusive remarks on the taxonomic position could only be made now almost all *Apocynaceae* represented in Africa have been monographed.

4.2. *Petchia ceylanica* (Wight) Livera in Ann. Roy. Bot. Gard. Peradeniya 10: 140, pl. 1 (1926). — Type: Sri Lanka, sin. loc., Walker s.n. in herb. Wight s.n. (holotype K).

Basionym: *Alyxia ceylanica* Wight, Icon. Pl. Ind. Or. 4 (2): 2, t. 1293 (1848).

Shrub 2.50 m high. Branches pale brown. *Leaves* in whorls of 3, shortly petiolate; petiole 1–3 mm long; blade membranaceous or papery when dried, ovate or elliptic or narrowly so, 1.7–3 x as long as wide, 2.5–9.5 x 1–3.5 cm, with 5–7 pairs of rather straight secondary veins forming an angle of 45–60° with the costa; tertiary venation minutely reticulate, rather conspicuous or invisible.

Inflorescence terminal, 1–6-flowered, 2–4 x 2–4 cm. Peduncle 0–14 mm long; pedicels thin, 5–12 mm long. Bracts like the sepals and about half as long as them. *Flowers*: *Sepals* ovate, ca 2 x as long as wide, 1.5–2 x 0.7–1 mm, long-acuminate, not ciliate. *Corolla* white, with a narrowly ovoid head in the mature bud about 0.3–0.4 of the bud length, pilose belt below the insertion of the stamens 1 mm wide; tube 5–6 x as long as the calyx, 1.5–1.6 x as long as the lobes, 9–10 mm long, ca 1 mm wide at the base, widened around anthers; lobes narrowly ovate, 6 x 3 mm, acuminate, spreading. *Stamens* with apex 0.5 mm below mouth of corolla tube; filaments ca 0.5 mm long; anthers 1 x 0.3 mm. *Pistil* with apex about halfway along the anthers; ovary 1 x 0.3 x 0.3 mm, gradually narrowed into the style; pistil head of 3 parts, the first of which may be absent, a basal ring ca 0.2 x 0.4 mm, a globe or cylinder ca 4 x 4 mm and a stigmoid apex ca 0.3 x 0.2 mm. *Fruit*: follicles orange or bright red, moniliform, of 1–5 ellipsoid parts 10–15 x 4–9 x 3–8 mm, wrinkled when dried; drupe ellipsoid, slightly smaller than the parts of the follicle; wall 0.3 mm thick. *Seed* one, medium brown, elliptic; embryo 6 mm long; cotyledons 3 x 3 mm; rootlet 4 x 0.7 mm.

Distribution: Endemic to Sri Lanka.

Ecology: Forest understorey. Alt. 140–500 m.

Specimens examined:

Sri Lanka. Badagama F.R., Kurunegala District, *Faden* 76/404 (AAU, K); *ibid.*, *Sumithraarachchi* 660 (K); Bibile, *Kostermans* 25299A (L); Kaduwela, *Balasubramaniam* BSM-4 (WAG); Mt Lavinia, near Colombo, *Rechinger* 2294 (W); Wega For., Colombo District, *Dassanayake* 492 (AAU, K); Seeduwa, Amandoluwa, *Cramer* 34513 (L); Kelaniya R., opposite Kitugalle, *Kostermans* 28345 (L); Henaratgoda (=Gampaha), *Petch* 6 Mar. 1923 (A); *ibid.*, *Worthington* 7094 (K); Kalatawewa Catchment, *Worthington* 3520 (K); near Matara, *Worthington* 4163 (K); Karawita Kanda, Ratnapura Distri, *Waas* 18 (K); Wasse Kadoerae, *Oltmans* 87 (L); *sin. loc.*, *Champion* anno 1851 (K); *Thwaites* CP 1835 (K, W); *Walker* s.n. in herb. *Wight* s.n. (K, type).

4. 3. *Petchia cryptophlebia* (Bak.) Leeuwenb., comb. nov. — Type: Central Madagascar, probably Province Toamasina, *sin. loc.*, *Baron* 1790 (holotype K; isotypes BM, P).

Fig. 9, p. 61; map 7, p. 62

Basionym and homotypic synonyms: *Carissa cryptophlebia* Bak. in Journ. Linn. Soc. 20: 204 (1883). *Jasminonerium crypto-*

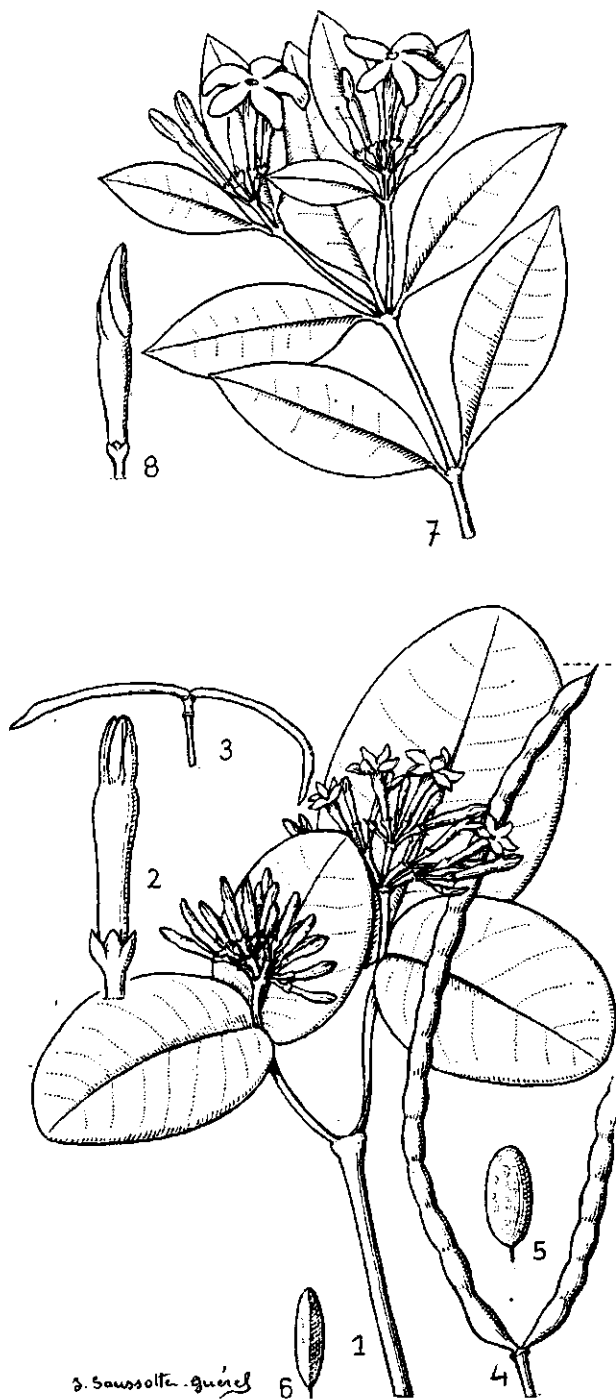
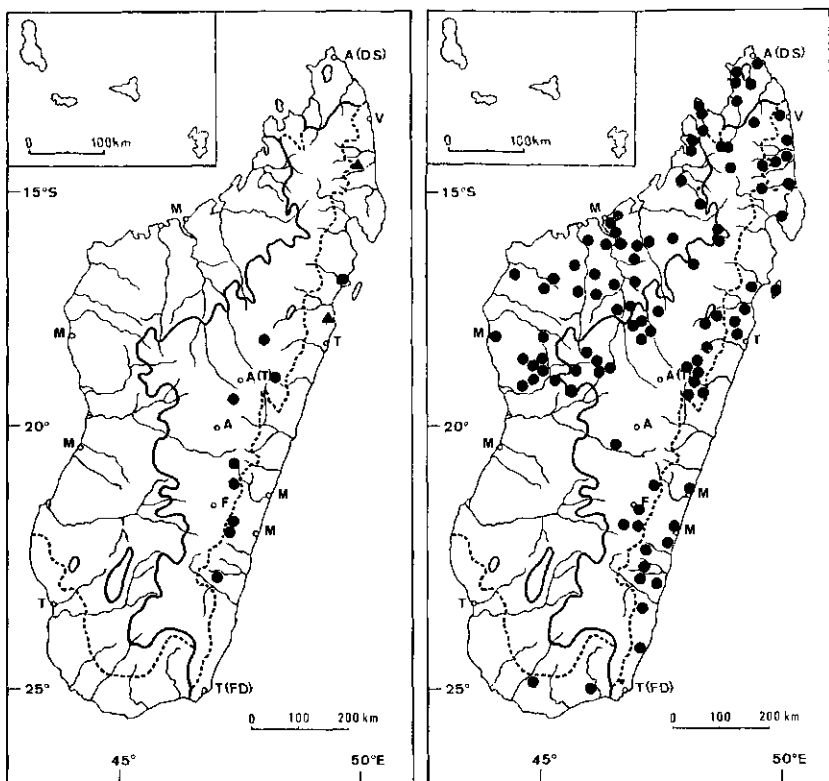


Fig. 9. 1-5. *Petchia cryptophlebia*. 1, habit (x 2/3); 2, flower bud (x 2); 3, young fruit (x 2/3); 4, fruit (x 2/3); 5 & 6, endocarp two sides (x 1.5). 7-8. *P. montana*. 7, habit (x 2/3); 8, flower bud (x 2). 1-2 from Viguiier & Humbert 852; 3 from Broin 26 Nov. 1969; 4-5 from Perrier de la Bâthie 8925; 6 from Humbert 3191; 7 from Perrier de la Bâthie 16314.



Map 7. ● *Petchia cryptophlebia*; ▲ *P. humbertii*.

Map 8. *Petchia erythrocarpa*.

phlebium (Bak.) O. Kuntze, Rev. 415 (1891). *Cabucala cryptophlebia* (Bak.) Pichon in Not. Syst. ed. Humbert 13: 205 (1948); Markgraf, Fl. Mad. fam. 169: 68, pl. 10, 9–13, map 17 (1976).

Shrub or small tree, 3–8 m high, with white latex. Trunk 5–25 cm in diameter or probably more; bark pale grey-brown, smooth or hardly fissured, with large protruding lenticels. Branches brown. *Leaves* in whorls of 3–5 or opposite, shortly petiolate; petiole 1–3(–8) mm long; blade coriaceous even when fresh, elliptic or ovate, 1.5–2.5 x as long as wide, 3–16 x 2–8.5 cm, rounded to very shortly apiculate at the apex and then with a blunt acumen, subcordate or rounded at the base, with 7–20 pairs of rather straight secondary veins forming an angle of (55–)70–90° with the costa; tertiary venation inconspicuous. *Inflorescences* terminal, 1–3 together, few- or many-flowered. 3–8 x 3–6 cm,

rather lax. Peduncle 3–45 mm long; pedicels 2–6 mm long. Bracts sepal-like and 0.2–1 x as long as them. *Flowers*: *Sepals* medium green, ovate or broadly ovate, 1–1.5 x as long as wide, 1.5–2 x 1.3–2 mm, not ciliate. *Corolla* white, with a narrowly ovoid head in the mature bud about 0.25 of the bud length, mostly pubescent at the base of the lobes, glabrous or sometimes pubescent from the mouth to the insertion of the stamens, pilose belt below the insertion of the stamens 4–10 mm wide; tube 10–12 x as long as the calyx, 2–2.7 x as long as the lobes, 16–20 mm long, just above the base 1.5–2.2 mm wide, slightly narrowed above or not to 1.8–2 mm wide, 2.5–3 mm wide around the anthers; lobes narrowly ovate, 0.36–0.5 x as long as the tube, 2.1–2.6 x as long as wide, 6–10 x 2.5–3.8 mm, rounded or obtuse, spreading. *Stamens* with apex 0–1 mm below mouth of corolla tube, inserted 0.85–0.9 of the length of the corolla tube (at 13.4–16.8 mm from the base); filaments 0.5–1 mm long; anthers 2.6–3.5 x as long as wide, 1.8–2.5 x 0.6–0.7 mm. *Pistil* with apex 0–1 mm above base of anthers; ovary 2.5–3.5 x 1.3 x 0.8–1 mm, gradually narrowed into the style; pistil head of a cylinder 1 x 0.5 mm, which is usually widened at the apex and at the base to 0.6 mm wide, and a stigmoid apex, 0.1–0.3 x 0.1–0.3 mm. *Fruit*: follicles with 2–13 drupes, 3–4 mm thick between drupes; parts at least 10 x 5 mm.

Distribution: Endemic to Madagascar.

Ecology: Rain forest. Alt. 800–1300 m.

Geographical selection of the 43 specimens examined:

Madagascar. Toamasina: Bemanditra, *Razafindradora* 53 (P); Anjozorobe, Moramanga, *Malcomber* et al. 1697 (BR, P, TAN, WAG); Ambatovy, E of Ampitambe, *Capuron* SF 28390 (K, P, TEF); Analamazaotra Forest, S of Perinet, *Leeuwenberg* 13735 (TAN, WAG); *ibid.*, *Perrier de la Bâthie* 8925 (P); *ibid.*, *Capuron* SF 22068 (K, P, TEF, WAG); *ibid.*, *Viguiet & Humbert* 852 (K, P, TAN, WAG). Antananarivo: Andrangoloaka, *Hildebrandt* 3679 (BM, G, K, P, W, Z); km 27 Moramanga-Anosibe Road, *Broin* 26 Nov. 1969 (B, P); Ambatotsipihina, Ambatolampy, SF 1002 (P, TAN, TEF). Fianarantsoa: Ambohimitombe, S of Nosy Varika, *Forsyth Major* 324 (K); Ranomafana Res., NE of Fianarantsoa, *Leeuwenberg* et al. 14138 (BR, K, P, TAN, WAG); *ibid.*, *Schatz* et al. 1706 (BR, C, K, TAN, WAG); km 50 Fianarantsoa-Mananjary Road, across Namorana R., *Nicoll* 208 (K, P, TAN, WAG); E of Tsaratanteraka, Anivorano Canton, Fort-Carnot (= Ikongo) District, SF 16287 (P); between Ivohibe and Vondrozo, *Capuron* SF 23549 (K, P, TEF, WAG). Sin. loc., *Baron* 853 (P), 1790 (BM, K, P, type), 3234 (BM, K, P), 5765 (K), 6018 (K).

4. 4. *Petchia erythrocarpa* (Vatke) Leeuwenb., comb. nov. — Type: Madagascar, Antsiranana, Nosy Komba, *Hildebrandt* 3232 (holotype BREM; isotypes K, L, P, W). Fig. 10, p. 65; map 8, p. 62

Basionym and homotypic synonyms: *Ellertonia madagascariensis* Radlk. in Abh. Naturw. Ver. Bremen: 8: 402 (1884). *Alyxia erythrocarpa* Vatke in Abh. Naturw. Ver. Bremen 9: 124 (1885). *Gynopogon erythrocarpus* (Vatke) K. Schum. in Engler & Prantl, Nat. Pflanzenf. 4, 2: 151 (1895). *Cabucala madagascariensis* var. *latifolia* Pichon in Not. Syst. ed Humbert 13: 203 (1948); *Cabucala erythrocarpa* (Vatke) Markgr. in Adansonia II, 10: 513: (1970); Fl. Mad. fam. 169: 84, map 11 (1976).

Heterotypic synonyms: *Alyxia lucida* Bak. in Journ. Linn. Soc. 22: 503 (1887). — Type: Central Madagascar, sin. loc., *Baron* 4663 (lectotype K, designated here; isolectotypes BM, E, P).

Cabucala madagascariensis var. *intermedia* Pichon, l.c. *C. erythrocarpa* var. *intermedia* (Pichon) Markgr., l.c.; op. cit. 86, map 11, **syn. nov.** — Type: Central Madagascar, sin. loc., *Baron* 4551 (holotype P; isotype K, paratype of *A. lucida*).

C. madagascariensis var. *angustifolia* Pichon, l.c. *C. erythrocarpa* var. *angustifolia* (Pichon) Markgr., l.c.; op. cit. 87, map 11, **syn. nov.** — Type: Madagascar, Mahajanga, Ambodina, Ikopa R., *Perrier de la Bâthie* 18 (holotype P).

C. monarthron Pichon, l.c.; Markgraf, op. cit. 78, map 13, **syn. nov.** — Type: Madagascar, Antananarivo, Manankazo, NE of Ankazobe, *Perrier de la Bâthie* 8883 (holotype P).

C. striolata Pichon, l.c.; Markgraf, op. cit. 80, map 13, **syn. nov.** — Type: Madagascar, Toamasina ("Centre West"), Upper Bemarivo R., *Perrier de la Bâthie* 8839 (holotype P).

C. caudata Markgr. in op. cit. 512; op. cit. 82, map 12, **syn. nov.** — Type: Madagascar, Est, Fianarantsoa, Manakara, Ifaho-Ambila, *Debray* 533 (holotype P; isotype B).

C. oblongo-ovata Markgr. in Adansonia II, 14: 107, t.1, f.1 (1974); op. cit. 83, map 12, **syn. nov.** — Type: Madagascar, Fianarantsoa, near Vohipeno, *Debray* 1256 (holotype P; isotype B).

Small tree 1.50–7 m high, with white latex in all parts. Trunk 1–10 cm in diameter; bark pale brown, shallowly and longitudinally fissured or smooth, with large lenticels. Branches pale brown. Leaves in whorls of 3–5, shortly petiolate; petiole 0.5–2

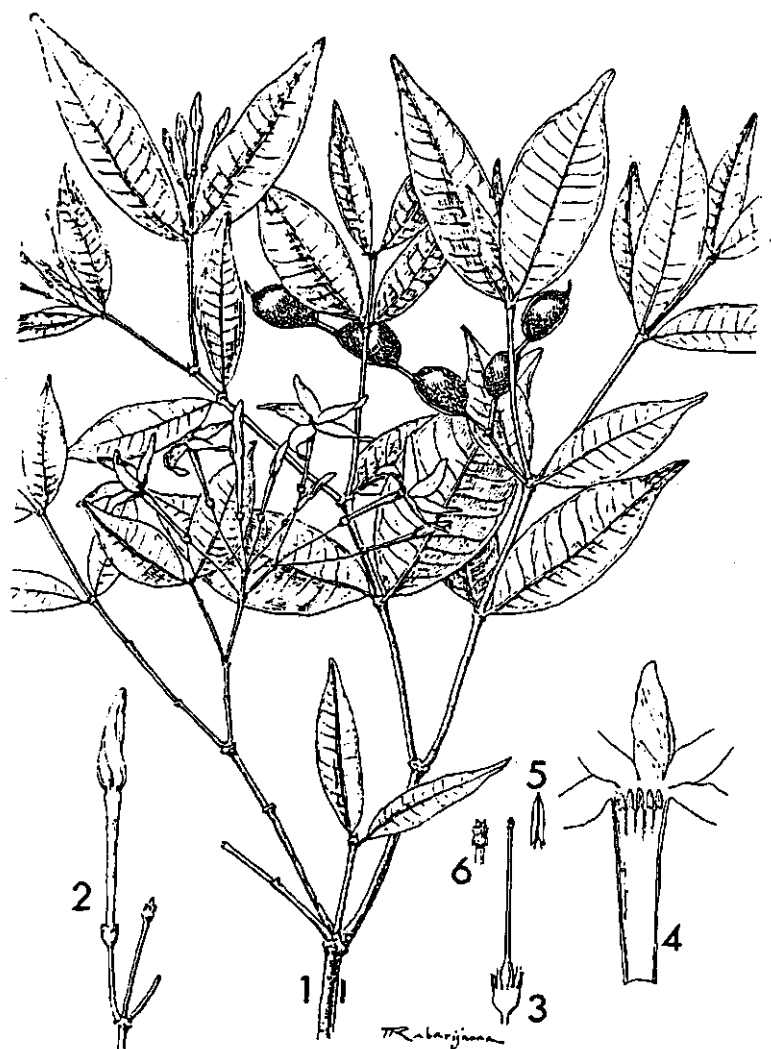


Fig. 10. *Petchia erythrocarpa*. 1, habit ($\times 2/3$); 2, flower bud ($\times 4/3$); 3, calyx with pistil ($\times 4/3$); 4, opened corolla ($\times 4/3$); 5, stamen ($\times 10/3$); 6, pistil head ($\times 10/3$).

(—8) mm long; blade herbaceous or subcoriaceous when fresh, membranaceous or papery and often striolate when dried, especially when young, very variable in shape and size, ovate or elliptic or narrowly or even very narrowly so, 1.5–10 x as long as wide, 2–13 x 0.5–6 cm, caudate or acuminate at the apex with a blunt acumen, cuneate or rounded at the base, with 5–15 pairs of rather straight often obscure secondary veins forming an angle of 45–60° with the costa; tertiary venation minutely reticulate, rather conspicuous or invisible. *Inflorescence* terminal, 1–13-flowered, 2–4 x 2–4 cm. Peduncle 0–12 mm long; pedicels thin, 5–15 mm long. Bracts sepal-like and about half as long as them. *Flowers*: *Sepals* pale or medium green, ovate, 1.2–2.5 x as long as wide, 1–2.5 x 0.8–1 mm, obtuse, not ciliate. *Corolla* salmon or pale yellow, with a narrowly ovoid head in the mature bud about 0.3–0.4 of the bud length, pilose belt below the insertion of the stamens 0.5–2.5 mm wide; tube 8–18 x as long as the calyx, 1.2–3 x as long as the lobes, 13–23 mm long, 1–1.2 mm wide at the base, slightly narrowed above or not to 0.8–1 mm wide, 2 mm wide around the anthers; lobes narrowly ovate to oblong, 0.3–0.8 x as long as the tube, 3–6.4 x as long as wide, 6–16 x 1.5–3.5 mm, rounded or obtuse, spreading and recurved later. *Stamens* with apex 0.5 mm below mouth of corolla tube, inserted 0.87–0.9 of the length of the corolla tube (at 11–20.5 mm from the base); filaments 0.5 mm long; anthers 2–3 x as long as wide, 1.5–1.8 x 0.5–0.8 mm. *Pistil* with apex from 0.5 mm above base of anthers to 0.5 mm above mouth of corolla tube; ovary 2–3 x 0.8–1 x 0.6–0.8 mm, gradually narrowed into the style; pistil head of 4 parts, the first or the third may be absent, a basal ring 0.1–0.2 x 0.3–0.4 mm, a globe or cylinder 0.3–0.5 x 0.3–0.5 mm, again a ring 0.1–0.2 x 0.3–0.4 mm and a stigmatic apex 0.2–0.4 x 0.2–0.3 mm. *Fruit*: follicles orange or bright red, moniliform, of 1–9 ellipsoid parts, smooth when fresh, 8–18 x 4–9 x 3–8 mm, wrinkled when dried; drupe ellipsoid, up to 17 x 6 x 4 mm, with an acute edge; wall 0.3 mm thick. *Seed* one, medium brown, elliptic; embryo up to 8.5 mm long; cotyledons 4.5 x 2.7 mm; rootlet 4 x 0.7 mm.

Distribution: Endemic to Madagascar.

Ecology: Forest understorey or bush. Alt. 0–1000 m.

Geographical selection of the approximately 275 specimens examined:

Comoro Islands. Grand Comore: La Gille Forest, near Maoueni, *Bernardi* 11680 (G, K, L, P, Z); *ibid.*, *Doutrelepont* 1235 (BR, WAG). Moheli: Fomboni, *Rakotozafy* 1114 (B, P, TAN), 1114 bis (TAN); Njoubadjou Forest, SF 16606 (K, P, TEF), 21754 (P, TEF); *ibid.*, *Jacquemin* 859 (B, P). Anjouan: *sin. loc.*, Kirk Aug. 1862 (K); *Lavanchie s.n.* (P). Mayotte: *sin. loc.*, *Boivin* 3202 (G, P); Dapani Forest, *Floret* 1091 (P), 1092 (P), 1106 (P); Dzoumogné, *Pobéguin* 60 (K, P, WAG); Ouchoungui Forest, SF 16771 (P, TEF).

Madagascar. Mahajanga: Bekopaka, SF 21053 (K, P, TEF, WAG); *ibid.*, Mijamo, *Rakotozafy* 1000 (TAN); *ibid.*, *Jacquemin* 753 (B, P); near Tsiandro, *Leandri & Capuron* 2346 (K, P, WAG); Bemaraha Plateau, near Tsiandro, *Capuron* SF 6750 (P, TEF); near Ambodiriana, E of Antsalova, *Leandri & Saboureaux* 2606 (P, WAG), 2606 bis (K, P); Tsingy of Bemaraha, *Leandri* 123 bis (BM, G, P); Antsalova, *Harmelin* RN 10205 (P); E of Antsalova, near Bemaraha Reserve, *Labat et al.* 2173 (P); N of Bemonto Forest, SF 39-R-44 (TEF); Makara Forest, near Ambalabongo, *Debray* 1512 (B, P); Analalava Forest, near Maintirano, SF 14786 (K, P, TEF, WAG); near Marofenobe, *Decary* 2296 (BM, P); *ibid.*, SF 16335 (= 90-R-44) (P, TEF); Tampotratsa, km 180 Antananarivo-Mahajanga Road, *Boiteau* 3005 (P, WAG); Ambibaka, Andriba Canton, *Kasambo* SF 12-R-317 (P, TEF); Ambodina, Ikopa R., *Perrier de la Bâthie* 18 (P, type of *C. madagascariensis* var. *angustifolia*); Ankara Mts, Maevatanana District, *Descouings* 3370 (TAN); near Maevatanana, *Morat* 882 (P, TAN); *ibid.*, *Perrier de la Bâthie* 18 bis (P), 8881 (P); Mafivato, SF 4283 (P, TAN, TEF); Sitampiky Plateau, *Decary* 7756 (P); Bekarafa, E of Bekodoka, *Decary* 8125 (P); near Bekodoka, *Decary* 2274 (P), 8262 (L, P); Besalampy, *Decary* 15641 (K, P), 15651 (K, P, WAG); *ibid.*, Ankaboka, SF 10731 (K, P, TEF, WAG); Namoroka Reserve, *Morat* 834 (TAN); *ibid.*, RN 4606 (P, TAN); Anjiaia, *Bosser* 3267 (P, TAN); Ampijoroa, F.R., Ankarafantsika, *Leeuwenberg* 13870 (TAN, WAG); *ibid.*, *Nicoll* 371 (K, P, TAN, WAG), 372 (K, P, TAN, WAG); *ibid.*, *Phillipson* 1917 (BR, K, P, TAN, WAG); *ibid.*, *Schatz & Lowry* 1438 (BR, K, P, TAN, WAG); *ibid.*, SF 7949 (K, P, TEF, WAG); Ambalabongo, Ambalajakomby, *Peltier* 5983 (P); Sainte Marie de Marovoay, *Kaudern* 7 Sept. 1911 (S), 20 June 1912 (S); 23 km N of km 19 Mahajanga-Tsaramandroso Road, towards Anjohibe, *Leeuwenberg & Rapanarivo* 14694 (BR, MO, P, TAN, WAG); Besisika, Port Bergé, *Rabesaona* SF 65-R-142 (TEF); between Sofia and Mandritsara Rs., *Decary* 14440 (BM, C, P); *ibid.*, *Humbert* 18073 (G, K, P, TAN); km 21 Befandriana Nord-Antsohihy Road, *Leeuwenberg & Rapanarivo* 14770 (BR, MO, P, TAN, WAG); Mahajanga, *Decary* 17049 (P); Borivatra, *Bosser* 3527 (TAN); 8 km W of Mandritsara, *Schofield* 4 (K); Befandriana-Nord, *Decary* 14471 (P); Bora Forest, Antsohihy, *Rabevohitra* SF 29558 (TEF); Ankaizina Mts, *Perrier de la Bâthie* 8944 (P); Andranosamontana, *Decary* 2233 (P). Antsiranana: Diégo-Suarez, SF 3560 (HBG, K, P, WAG); Mt d'Ambre, near Station des Roussettes, *Leeuwenberg et al.* 14287 (BR, MO, P, TAN, WAG); *ibid.*, *Capuron* SF 22056 (G, HBG, K, P, TEF, WAG); Beanamalao, SF 31133 (= 164-R-416) (TEF); SE of Marotaolana, *Debray* 1627 (B, P); Ankarana Mts, *Humbert* 32675 (P, WAG); *ibid.*, *Leeuwenberg et al.* 14254 (BR, MO, P, TAN, WAG), 14396 (BR, MO, P, TAN, WAG); Nosy Komba, *Boivin* July 1850 (P); *ibid.*, *Hildebrandt* 3232 (BREM, K, L, P, W, type); *ibid.*, Mahabo, SF 3150 (P, TAN, TEF); Nosy Be, *Hildebrandt* 2949 (BM, G, K, P, W); *ibid.*, Lokobe Reserve, *Birkinshaw* 60 (BR, P, TAN, WAG); *ibid.*, *Boivin* 2075 (P); *ibid.*, *Deroin & Badré* 165 (K, P, WAG); N of Lokobe Reserve, *Leeuwenberg et al.* 14273 (BR, MO, P, TAN, WAG); Analabe Forest, S of Vohemar, *Capuron* SF 27487 (K, P, TEF); Anjanaharibe Mt, *Cours* 3881 (P, TAN); Ambilobe,

Waterlot 330 (P); Sambirano R. valley, 7 km after Ambanja, *Imbert* 125 (K, P, WAG); Manongarivo Mts, base of Beholosy Ridge, *Leeuwenberg* et al. 14271 (BR, MO, P, TAN, WAG); Sambirano R. basin, near Beangona, *Humbert* 18741 (G, K, P, TAN); Tsaratanana Mts, *Decary* 14395 (L, P); Ambodivoara Andranomatavy, Sambava Canton, SF 19057 (P, TEF); Sambava, *Morat* 2813 (P, TAN); *ibid.*, *Zamani Vato* RN 8826 (K, P, WAG); Bemarivo R., of NE, *Perrier de la Bâthie* 8896 (P); Lohanantsahabe, between Sambava and Andapa, *Capuron* SF 24946 ter (P, TEF); near Andapa, Lokoho R. basin, *Humbert & Capuron* 22023 (K, P, WAG); Fivondronana of Andapa, *Ravelonarivo* 70 (WAG); Antanandavahely Escarpment, Antalaha, *Rakotozafy* 506 (TAN). Toamasina: Masoala Peninsula, near Andranobe, *Van Nek* 2066 (WAG); Upper Bemarivo R. (Centre West), *Perrier de la Bâthie* 8839 (P, type of *C. striolata*), 8842 (P); Île Ste Marie, NE of Lokintsy, *Capuron* SF 28838 (K, P, TEF, WAG); Kapiloza R. source, Ambongo, *Perrier de la Bâthie* 18585 (P); Tampolo, *Rabevohitra* SF 32004 (TEF), 32005 (TEF), 32006 (TEF); Ambodimanga, Sahatavy, *Ramarokoto* RN 9481 (K, P, paratype of *C. oblongo-ovata*); Ambatosoratra Mt, *Cours* 3257 (P, TAN); Manaka Est, *Rakotovao* RN 11777 (P); Betampona Reserve, near Tamatave, RN 2617 (P, TAN); *ibid.*, *Razanaparany* RN 8882 (K, P, WAG); Anosibe, Moramanga District, SF 2201 (P, paratype of *C. oblongo-ovata*); near Ankarahara, near Mangoro R. valley, *Capuron* SF 20338 (K, P, TEF, WAG); W of Ambohidray, upper Mangoro R., *Capuron* SF 28364 (K, P, TEF, WAG); Ambatovola, *Perrier de la Bâthie* 18360 (P); N of Ambodimanga, Mangoro R., *Capuron* SF 28135 (P, TEF). Antananarivo: Tsiroamandidy, *Boiteau* 3026 (P); Ankazobe Mts, NW of Manarinerina, *Capuron* SF 24007 (G, K, P, TEF, WAG); Manankazo, NE of Ankazobe, *Perrier de la Bâthie* 8883 (P, type of *C. monarthron*); *ibid.*, SF 14087 (P, TEF); km 130 Antananarivo-Mahajanga Road, *Bosser* 1849 (TAN); 3 km NW of Ambohitsaratelo-Bebao, NW of Tsiroamandidy, *Dorr* et al. 3591 (MO, TAN, WAG); Sahagoma, Bevato, SF 2-R-286 (P); Bongolava, W of Tsiroamandidy, *Morat* 4744 (P), 4579 (P, TAN); Itasy Lake, Anonym. 4 (P). Fianarantsoa: Itremo, *Guillaumet* 4218 (K, P, TAN, WAG); Mananjary, *Geay* 7722 (P); *ibid.*, SF 31360 (= 184-R-496) (TEF); Ranomafana Reserve, NE of Fianarantsoa, *Leeuwenberg* et al. 14142 (BR, K, P, TAN, WAG); Andrambovato Forest, E of Fianarantsoa, *Capuron* SF 11591 (K, P, TEF); Ambalavao, Ingaro Mts, SF 13756 (P); Ifaha, Ambila, N of Manakara, *Debray* 533 (B, P, type of *C. caudata*); ESE of Ambila, *Debray* 1249 (P); near Vohipeno, *Debray* 1256 (B, P); near Lokomby, Manakara, *Capuron* SF 23701 (K, P, TEF, WAG); Vondrozo-Ivohibe Road, *Broin* 138 (P), 139 (P); Matitanana R. basin, *Perrier de la Bâthie* 8928 (P); near Vondrozo, *Boiteau* 2123 (P, WAG); Anohambovato, SF 13261 (P, TEF); Manombo Forest, *Boiteau* 2119 (K, P, WAG); *ibid.*, *Capuron* SF 23637 (K, P, TEF, WAG); Midongy du Sud, *Decary* 4967 (P). Toliara: km 17 Miandrivazo-Mandoto Road, *Rakotozafy* 1620 (TAN); Amboasary, N of Ankazobe, *Decary* 7390 (P); Miandrivazo, *Decary* 15194 (P, S); 15 km N of Fort-Dauphin, *Den Outer & Van Veenendaal* 1224 (WAG); Analalava Forest, Manantenina, *Dumetz* 1366 (P). Sin. Loc., *Baron* 654 (K, P), 2525 (K), 4551 (K, P, type of *C. m. var. intermedia* and paratype of *Alyxia lucida*), 4663 (BM, E, K, P, lectotype of *A. lucida*), 4888 (BM, K, P, paratype of *A. lucida*), 5916 (K, P), 6084 (K), 6541 (K, P).

Notes. The earlier epitheton *madagascariensis* Radlk. (1884) is not available, as the even earlier homonym, *Alyxia madagascariensis* A. DC. (1844) is used for another species.

P. erythrocarpa, the most widespread species of *Petchia*, has a great variation in the shape and size of the leaves, but it is rather constant in the flowers. The leaves are smooth as in the type of *Cabucala oblongo-ovata* or striolate as in the types of *C. caudata* and *C. striolata*, or both smooth and striolate within one branch, e.g. *Humbert* 32675. They are clearly acuminate to caudate when up to 5 x as long as wide, as in the types of *C. madagascariensis* var. *intermedia*, *C. monarthron*, *C. striolata*, *C. caudata* and *C. oblongo-ovata*. The follicles are quite variable in length. They may contain 1—13 drupes and therefore the only character, a single drupe in each follicle, on which *C. monarthron* has been based, lost its value.

4. 5. *Petchia humbertii* (Markgr.) Leeuwenb., comb. nov. —
 Type: Madagascar, Antsiranana, eastern slopes of Marojejy Mts, W of Manantenina R., tributary of Lokoho R., *Humbert* 22595 (holotype P).
 Fig. 11, p. 70; map 7, p. 62

Basionym: *Cabucala humbertii* Markgr. in *Adansonia* II, 10: 511 (1970; Fl. Mad. fam. 169: 77, pl. 11, 3—4, map 14 (1976)).

Shrub. Branches pale brown. *Leaves* opposite or in whorls of 3 at apices of branchlets; petiole 1—5 mm long; blade coriaceous when dried, elliptic, 1.2—2.5 x as long as wide, 1—4 x 0.7—2.7 cm, obtuse or rounded at the apex, cuneate at the base, with revolute margin in dried leaves, with 4—8 pairs of rather straight obscure secondary veins forming an angle of 45—80° with the costa; tertiary venation invisible. *Inflorescence* terminal, few-flowered, 1.5 x 1.5—2 cm, lax. Peduncle 10—13 mm long; pedicels 5—7 mm long. Bracts leafy and much smaller than the leaves or sepal-like and about half as long as them. *Flowers*: *Sepals* ovate, 1.5—2 x as long as wide, 1—1.2 x 0.6—0.7 mm, obtuse, not ciliate. *Corolla* pale yellow, with an ovoid obtuse head in the mature bud about one third of the bud length, pilose belt below the insertion of the stamens 1 mm wide; tube 4—5.5 x as long as the calyx, 1.6—1.7 x as long as the lobes, 5—5.5 mm long, 0.6—1.5 mm wide at the base, 1.5—1.8 mm wide around the anthers; lobes ovate or oblong, 0.6 x as long as the tube, 2.5—3 x as long as wide, 3—3.5 x 1.2 mm, rounded, entire, spreading. *Stamens* with apex at mouth of corolla tube, inserted 0.7 of the length of the corolla tube (at 3.5—4 mm

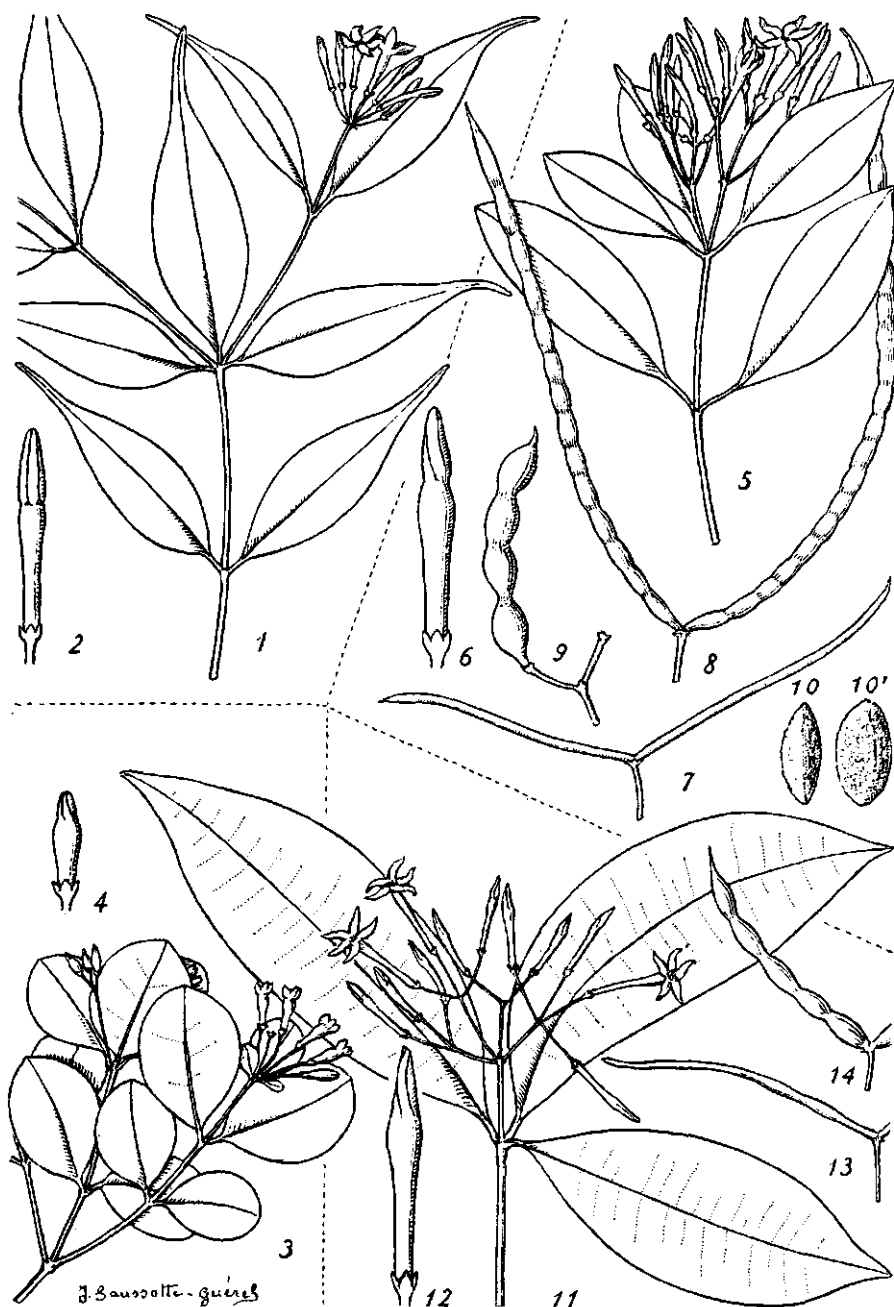


Fig. 11. 1-2, *Petchia plectaneifolia*. 1, habit (x 2/3); 2, flower bud (x 3). 3-4. *P. humbertii*. 3, habit (x 2/3); 4, flower bud (x 2). 5-14. *P. madagascariensis*. 5 & 11, habit (x 2/3); 6 & 12, flower buds (x 2); 7 & 13, young fruits (x 2/3); 8, immature fruit (x 2/3); 9 & 14, fruits (x 2/3). 10, endocarp two sides (x 1.5). 1-2 from RN 8173; 3-4 from Humbert 22595; 5-6 from Boiteau 2610; 7-8 from Capuron SF 23936; 9-10 from Decary 9768; 11 from Debray 781; 12-13 from Bernier 106; 14 from Perrier de la Bâthie 16034.

from the base); filaments 0.5 mm long; anthers 1.5 x 0.4 mm. *Pistil* with apex just below base of anthers; ovary 1.2 x 0.5 x 0.4 mm, gradually narrowed into the style; pistil head of a basal ring 0.2 x 0.4 mm, a globe 0.4 x 0.4 mm and a stigmoid apex about 0.2 x 0.2 mm. *Fruit* unknown.

Distribution: Only known from four collections three of which were made at the same locality.

Ecology: Montane forest. Alt. 1450 m.

Specimens examined:

Madagascar. Antsiranana: Lokoho R. valley, Mt Beondroka, N of Maroambihy, *Humbert* 23514 (B, P); Marojejy Res., *Rasoavimbahoaka* et al. 23 (P, TAN, WAG); eastern slopes of Marojejy Mts, W of Manantenina R., tributary of Lokoho R., *Humbert* 22595 (P, type). Toamasina: Foulpointe, Mahatsara, SF 32829 (= 1600-R-631) (TEF).

4. 6. *Petchia madagascariensis* (A. DC.) Leeuwenb., comb. nov. — Type: Madagascar, North of Madagascar, *Richard*(?) in Herbarium Boissier ex herbario Musaei Parisiensis anno 1843 (holotype G; isotypes G-DC, L 908.335-720 and 908.335-721).

Figs. 11, p. 70 and 12, p. 72; photos 5, p. 123; 6, p. 123 and 7, p. 124; map 9, p. 73

Basionym and homotypic synonyms: *Alyxia madagascariensis* A. DC., Prod. 8: 345 (1844). *Pulassarium madagascariense* (A. DC.) O. Kuntze, Rev. 2: 417 (1891). *Gynopogon madagascariense* (A. DC.) K. Schum. in Engler & Prantl, Nat. Pflanzenf. 4, 2: 151 (1895). *Cabucala madagascariensis* (A. DC.) Pichon in Not. Syst. ed. *Humbert* 13: 203 (1948); Markgraf, Fl. Mad. fam. 169: 74, pl. 11, 11-14, map 15 (1976) as var. *madagascariensis*. *C. madagascariensis* var. *latifolia* Pichon, l.c., excl. of syn. *Ellertonia madagascariensis* and its type which belongs to *P. erythrocarpa*.

Heterotypic synonyms: *A. polysperma* Sc. Elliot in Journ. Linn. Soc. 29: 33 (1891). *C. polysperma* (Sc. Elliot) Pichon in op. cit. 204; Markgraf, op. cit. 76, pl. 11, 5—10, map 14, **syn. nov.** — Type: Madagascar, Toliara, Fort-Dauphin, *Scott Elliot* 2374 (holotype K; isotype P).

C. torulosa Pichon, l.c.; Markgraf, op. cit. 72, pl. 10, 5-8, map 16, **syn. nov.** — Type: Madagascar, Antsiranana, Sambirano, near Ambanja, *Perrier de la Bâthie* 8855 (holotype P).

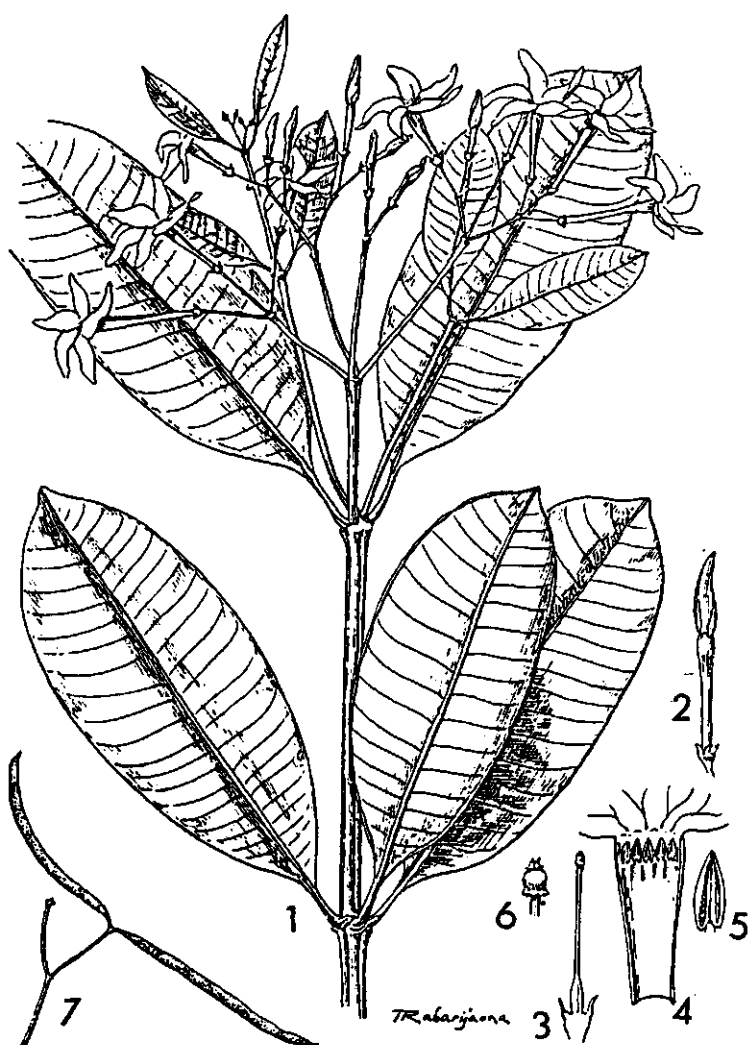
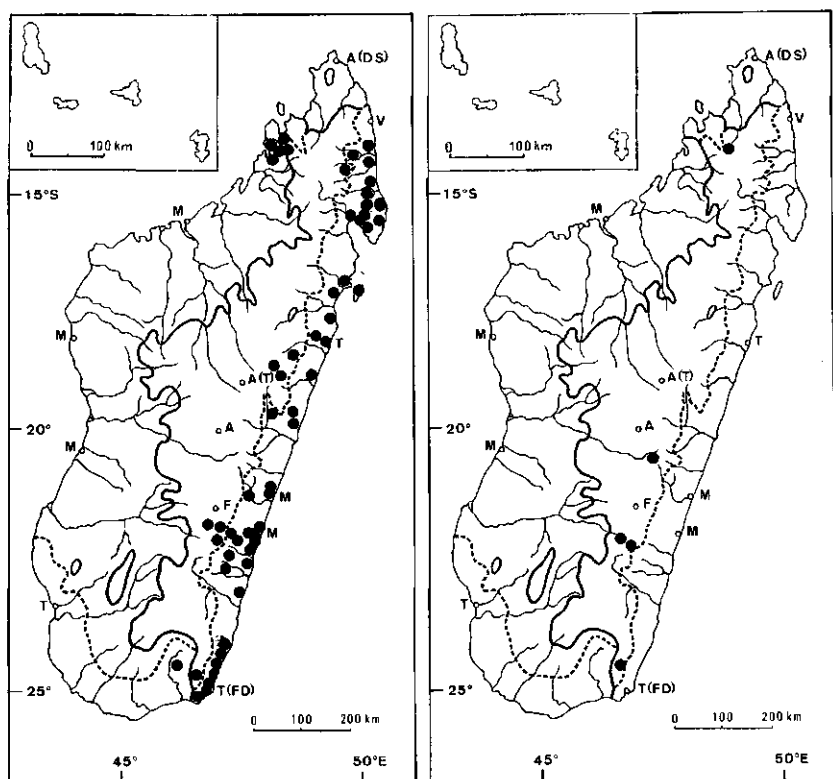


Fig. 12. *Petchia madagascariensis*. 1, habit (x 2/3); 2, flower bud (x 4/3); 3, calyx with pistil (x 4/3); 4, opened corolla (x 4/3); 5, stamen (x 10/3); 6, pistil head (x 10/3); 7, immature fruit (x 2/3).



Map 9. *Petchia madagascariensis*.

Map 10. *Petchia montana*.

- C. fasciculata* Pichon, l.c.; Markgraf, op. cit. 64, pl. 9, 10-14, map 18, **syn. nov.** — Type: Madagascar, Toamasina, Masoala Peninsula, *Perrier de la Bâthie* 8900 (holotype P).
- C. glauca* Pichon, l.c. — Type: Madagascar, Toamasina, Île St. Marie, *Bernier* 106 (holotype P, erroneously cited as type of *C. madagascariensis* by Markgraf).
- C. macrophylla* Pichon, l.c.; Markgraf, op. cit. 70, pl. 10, 1-2, map 16, as var. *macrophylla*, **syn. nov.** — Type: Madagascar, Fianarantsoa, Ikongo Mts, *Decary* 5535 (holotype P; isotypes BM, K, TAN).
- C. intermedia* Pichon in op. cit. 205. — Type: Madagascar, Toamasina, W of Tamatave, Betampona Reserve, near Ambodiriana, *Perrier de la Bâthie* 17488 (holotype P; isotypes K, TAN).
- C. multiflora* Pichon, l.c.; Markgraf, op. cit. 65, pl. 9, 3-7, map 17, **syn. nov.** — Type: Madagascar, Toliara, Belavenoke, WNW

- of Fort-Dauphin, *Decary* 10615 (holotype P; isotypes G, K, S, TAN).
- C. longipes* Pichon, l.c. *C. madagascariensis* var. *longipes* (Pichon) Markgr. ex Boiteau in *Adansonia* II, 12: 222 (1972); Markgraf, op. cit. 75, map 15, **syn. nov.** — Type: Madagascar, sin. loc., *Humblot* 58 (holotype P).
- C. crassifolia* Pichon in op. cit. 206; Markgraf, op. cit. 66, pl. 9, 1—2, map 18, **syn. nov.** — Type: Madagascar, Fianarantsoa, Vondrozo, *Decary* 5331 (holotype P; isotypes K, TAN).
- C. macrophylla* var. *acuta* Markgr. in *Adansonia* II, 10: 511 (1970). *C. madagascariensis* var. *amygdalifolia* Markgr. ex Boiteau in *Adansonia* II, 11: 555 (1971). *C. madagascariensis* var. *acuta* (Markgr.) Markgr., Fl. Mad. fam. 169: 75, map 15 (1976), **syn. nov.** — Type: Madagascar, Toamasina, Analamaitso Forest, upper Bemarivo R., *Perrier de la Bâthie* 8840 (holotype P).
- C. penduliflora* Markgr. in *Adansonia* II, 10: 511 (1970); op. cit. 82, map 13, **syn. nov.** — Type: Madagascar, Toamasina, W of Tamatave, Betampona Reserve, *Rakotoniaina* RN 4242 (holotype P; isotype K).
- C. macrophylla* var. *oxyphylla* Markgr. in *Adansonia* II, 14: 109 (1974); op. cit. 72, map 16, **syn. nov.** — Type: Madagascar, Toliara, near Fort-Dauphin, Manantantely Forest, *Humbert* 5774 (holotype P; isotypes G, K, S).

Shrub or small tree, 1—8(—15) m high, with white latex. Trunk 1—25 cm in diameter; bark pale grey and dark brown, smooth or shallowly and longitudinally and often transversely fissured. Branches pale brown. *Leaves* in whorls of 3—4 at apices of branchlets, otherwise often opposite; petiole 1—15 mm long; blade coriaceous even when fresh, elliptic or narrowly elliptic, sometimes obovate or orbicular, 1—5 x as long as wide, 2—23.5 x 1.5—10.5 cm, acuminate to rounded at the apex, cuneate at the base, margin mostly revolute even in fresh leaves, with 5—20 pairs of obscure rather straight secondary veins forming an angle of 60—90° with the costa; tertiary venation invisible. *Inflorescences* terminal, often several together, sometimes also axillary, few- to many-flowered, 2—11 x 2—7 cm, lax or rather lax. Peduncle 3—60 mm long; pedicels thin, 2—11 mm long. Bracts sepal-like, 0.2—1 x as long as the sepals. *Flowers*: *Sepals* light green, ovate or broadly so, 1.2—1.7 x as long as wide, 1—2.5 x 0.7—1.7 mm, not or obscurely ciliolate. *Corolla* white, tube pale green or pale yellow, in

bud pale yellow, with a narrowly ovoid head in the mature bud about one third of the bud length, pilose belt below the insertion of the stamens 2.5–14 mm wide; tube 5.5–15 x as long as the calyx, 1.2–4.5 x as long as the lobes, (6.5–)8–25 mm long, 1–2 mm wide at the base, around the anthers 1.2–3 mm wide; lobes ovate, narrowly ovate or elliptic, 0.21–0.7 x as long as the tube, 1.5–5.2 x as long as wide, 2.5–13 x 1.5–4.5 mm, obtuse or rounded, spreading, often recurved later. *Stamens* with apex 0–3 mm below mouth of corolla tube, inserted 0.7–0.9 of the length of the corolla tube (at 4.5–20.5 mm from the base); filaments 0.3–1 mm long; anthers 3–4.5 x as long as wide, 1.2–2.5 x 0.4–0.8 mm. *Pistil* with apex from 2 mm below to 1 mm above base of anthers; ovary 1.5–3.5 x 0.7–1.5 x 0.6–1 mm, gradually narrowed into the style; pistil head of 4 parts, the third of which may be absent, a basal ring 0.1 x 0.3–0.8 mm, a globe or cylinder 0.3–0.4 x 0.3–0.5 mm, again a ring 0.1–0.2 x 0.3–0.7 mm and a stigmoid apex 0.2 x 0.2 mm. *Fruit*: follicles orange, with 1–13 drupes; intersections 0.2–0.8 x as wide as the compartments; compartments 6–16 x 5–6 x 3–4 mm.

Distribution: Endemic to Madagascar.

Ecology: Forest, mostly near the coast. Alt. 0–600 m.

Geographical selection of the approximately 175 specimens examined:

Madagascar. Antsiranana: Sambirano, *Perrier de la Bâthie* 8855 (P, type of *C. torulosa*); Manongarivo Reserve, E of Akaramy, *Malcomber* 2325 (MO, TAN); *ibid.*, W side of Beholasy Ridge, *Leeuwenberg* et al. 14268 (BR, MO, P, TAN, WAG); *ibid.*, *McPherson & Van der Werf* 16409 (WAG); *ibid.*, SE of Beraty, trail to summit of Antsatroto, *Malcomber* et al. 921 (BR, K, P, TAN, WAG); Maromandia, *Rabevohitra* SF 29504 (TEF); Marojejy Reserve, near Manantenina, *Randrianasolo* 44 (TAN); *ibid.*, Mt Beondroka base, *Miller & Randrianasolo* 4340 (WAG); S of Analamanana, near Tsaratanana, *Capuron* SF 27180 (K, P, TEF, WAG); Atiala Forest, *Deroin & Badré* 127 (K, P, WAG); Farimay Forest, Ampahana, SF 8-R-305 (P); Ambolo, *Perrier de la Bâthie* 16034 (P); Ambohitralanana, RN 8598 (P); Ambatondradama Pass, N of Masoala Peninsula, *Capuron* SF 8780 bis (P); Ampanavoana, *Tsilizy* RN 5490 (P), 5491 (P). Toamasina: Maroantsetra, *Mocquerys* 290 (G, Z); E of Sahavary, *Lowry* et al. 4237 (BR, K, P, TAN, WAG); Nosy Mangabe, Antongil Bay, *Schatz* et al. 1676 (K, P, TAN, WAG); Masoala Peninsula, *Perrier de la Bâthie* 8900 (P, type of *C. fasciculata*); *ibid.*, Ambanizana, *Lowry* 4465 (P, TAN, WAG); S of Ambanizana, *Van Nek* 2212 (WAG); E of Ambanizana, *Schatz & Lowry* 2833 (K, P, TAN, WAG); Analamaitso Forest, upper Bemarivo R., *Perrier de la Bâthie* 8840 (P, type of *C. macrophylla* var. *acuta*); Île St. Marie, *Bernier* 106 (P, type of *C. glauca*); Soanierana-Ivongo, *Perrier de la Bâthie* 8889 (P); Menatany Hill, *Capuron* SF 23820 (K, P, TEF, WAG); Tampolo Forest, *Leeuwenberg* 13751 (WAG); *ibid.*, *Capuron* SF 22116 (K, P, TEF, WAG), 23835 (P, TEF); between Volotaraina and Ambodirafia, *Cours* 1725 (P, TAN); Analalava Forest, W of

Foulpointe, *Capuron* SF 28076 (P, TEF, WAG), 23841 (K, P, TEF, WAG); *ibid.*, *Leeuwenberg* 13762 (BR, P, TAN, WAG); Betampona Reserve, near Ambodiriana, NW of Tamatave, *Debray* 781 (P); *ibid.*, *Leeuwenberg* 13776 (TAN, WAG); *ibid.*, *Perrier de la Bâthie* 17488 (K, P, TAN, type of *C. intermedia*); *ibid.*, *Rakotoniana* RN 4242 (K, P, type of *C. penduliflora*), RN 5923 (K, P, TAN, WAG); Analangavo, Tamatave, SF 1376 (P); between Didy and Brickaville, *Cours* 4938 (K, P, WAG); Analabe, Marovoay, Moramanga District, SF 26193 (P, TEF); near Ambila-Lemaitso, *Schatz & Armbuster* 3157 (K, P, TAN, WAG); *ibid.*, *Schatz et al.* 3441 (P, TAN, WAG); *ibid.*, SF 1132 (P, TAN, TEF); between Ambodimanga and Antanambao, *Cours* 2789 (P, TAN); Betamotamo Forest, Tsaravinany, *Rakotozafy* 597 (P, TAN); upper Sahadranamby R., Mangoro R. valley, *Perrier de la Bâthie* 8920 (P); lower Mangoro R. basin, *Perrier de la Bâthie* 18058 (G, P). Fianarantsoa: Ambodihazo-Androrangavola Road, Ifanadiana, *Debray* 1244 (B, P); Ingaro Mts, W of Ambalavao, *Cremers* 3603 (P, TAN); Ikongo Mts, *Decary* 5535 (BM, K, P, TAN, type of *C. macrophylla*); Fort Carnot (= Ikongo), *Decary* 5819 (BM, P); *ibid.*, Maromiandra, SF 7148 (P, TEF); Anorimbatonamboa, Fort Carnot (= Ikongo), SF 19789 (K, P, TEF, WAG); Amboatalanina, Mananjary, *Razafy* SF 5630 (K, P, TEF), SF 6640 (P, TEF); near Vohitromby-Ifoho, 10 km ESE of Ambila, *Debray* 1251 (B, P); Sihanaka, *Boiteau & Cours* in Herb. Jard. Bot. Tana. 2950 (P); Andringitra Reserve, Sendrisoa, *Razafindrakoto* RN 3492 (P, TAN); Bekatra, Manakara, *Capuron* SF 6537 (P, TEF); Loharano, SF 14812 (P, TEF, WAG); near Vohipeno, *Broin* 140 (B, P); Ilakatra, SF 6426 (P, TEF); km 179 Vohipeno-Farafangana Road, *Debray* 1255 (B, P, TAN); lower Matitanana R. basin, *Perrier de la Bâthie* 8929 (P); between Vondrozo and Ivohibe, *Decary* 5407 (C, P, paratype of *C. macrophylla* var. *oxyphylla*); Vondrozo, *Decary* 5312 (L, P), 5331 (K, P, TAN, type of *C. crassifolia*), 5418 (P); Amporofo Forest, between Farafangana and Vohipeno, *Capuron* SF 23981 (P, TEF); km 20 Farafangana-Manombo Road, *Capuron* SF 23604 (K, P, TEF, WAG); Manombo Forest, *Capuron* SF 23651 (HBG, K, P, TEF, WAG), 23936 (P, TEF), 23940 (K, P, TEF, WAG). Toliara: Belavenoke, *Decary* 10615 (G, K, P, S, TAN, type of *C. multiflora*); Bemangidy, Manantenina Canton, *Boiteau* 2546 (P); *ibid.*, *Gueneau* SF 21445 (= 3-R-32) (P, TEF, WAG); Tsingafafy Mts, *Capuron* SF 28671 (HBG, K, P, TEF, WAG); Fort-Dauphin, *Boiteau* 2610 (P); *ibid.*, *Decary* 9909 (BM, K, P, S, TAN); *ibid.*, *Scott Elliot* 2374 (K, P, type of *C. polysperma*); Vatombe, *Decary* 10599 (P, paratype of *C. macrophylla* var. *oxyphylla*), 10635 (L, P, paratype of *C. macrophylla* var. *oxyphylla*); Ebakika, 50 km N of Fort-Dauphin, *McWhirter* 214 (K, P); *ibid.*, *Capuron* SF 28342 (P, TEF, paratype of *C. macrophylla* var. *oxyphylla*); Andohahela Reserve, Parcelle 1, *Leeuwenberg et al.* 14188 (BR, K, P, TAN, WAG); *ibid.*, *Phillipson* 2982 (K, P, TAN, WAG); *ibid.*, *Ramarokoto* RN 3414 (K, P, TAN, WAG), 3427 (P, TAN, WAG); *ibid.*, Tanatana Pass, *Decary* 9768 (C, L, P); Maningotra, SF 4078 (P, TAN); between Ifarantsy and Ranomafana, *Capuron* SF 8505 (K, P, TEF, WAG); Petriky Forest, ca 15 km WSW of Fort-Dauphin, *Gereau & Dumetz* 3253 (BR, K, P, TAN, WAG); *ibid.*, *Rabevohitra* 2108 (K, P, TAN, TEF, WAG); Manantantely Forest, *Humbert* 5774 (G, K, P, S, type of *C. mac.* var. *o.*); Mandena Reserve, *Leeuwenberg et al.* 14203 (BR, K, P, TAN, WAG); *ibid.*, *Rabevohitra et al.* 1765 (K, P, TAN, WAG); *ibid.*, *Razafindrambao* 580 (B, P); *ibid.*, *Zarucchi et al.* 7452 (P, TAN, WAG); W of Mandena, *Debray* 1752 (P, paratype of *C. macrophylla* var. *oxyphylla*). Sin. loc., *Richard* (?) in Herb. Boissier ex Herb. Mus. Paris anno 1843 (G, G-DC, L, type); *Humblot* 58 (P, type of *C. longipes*), 88 (K, P), 657 (K, P); *Lantz* 30 Sept. 1881 (P).

Notes. *Petchia madagascariensis* is a very variable species. The characters vary independently. The leaves and inflorescences are very variable in shape and size. The flowers vary in size but much less in shape.

The types of *P. madagascariensis* and *Cabucala glauca* have very narrowly elliptic leaves which are acuminate at the apex and have a revolute margin. The leaves of the types of *C. fasciculata*, *C. macrophylla* and *C. peduliflora* are wider and have a less revolute margin and slightly more visible venation. In this respect *Leeuwenberg* 13759 is a perfect intermediate. The type of *C. multiflora* has smaller leaves than the specimens mentioned above, which resemble those of the types of *C. fasciculata* and *C. macrophylla*. The type of *C. madagascariensis* var. *acuta* has leaves as narrow as those of the types of *P. madagascariensis* and *C. glauca* but the venation is more conspicuous. The type of *C. torulosa* has slightly striolate leaves which resemble those of the type of *C. macrophylla* but they are much smaller. In both characters, striolation and size, *Capuron* SF 23841 is a perfect intermediate. As for the size they approach those of the type of *C. polysperma* of which the leaves are somewhat narrower and rounded at the apex. The type of *C. crassifolia* has also small rounded leaves which are wider than those of the type of *C. polysperma*. The type of *C. polysperma* has been collected near Fort-Dauphin, probably in the Mandena forest from where the type of *C. crassifolia* comes. In this forest has been collected *Leeuwenberg* 14203, a rich sample of the population which has leaves similar to those of the types of *C. crassifolia*, *C. polysperma* as well as *C. torulosa*. A perfect intermediate between the types of *C. polysperma* and *C. macrophylla* is *Capuron* SF 28671, especially for the leaves.

The inflorescences are few-flowered, as e.g. in *Leeuwenberg* 13751 and 13762, to very many-flowered, as e.g. in *Decary* 10615, the type of *C. multiflora* and *Decary* 10635.

The fruits are much more constant in shape and size, as they are usually less indented between the drupes than those of most of those of *P. erythrocarpa*.

These observations may show why the author is obliged to reduce so many names to synonyms of *P. madagascariensis*.

4. 7. *Petchia montana* (Pichon) Leeuwenb., comb. nov. —
Type: Madagascar, Fianarantsoa, Pic d'Ivohibe, Bara, *Humbert* 3191
(holotype P; isotype G). Fig. 9, p. 61; map 10, p. 73

Basionym: *Cabucala montana* Pichon in Not. Syst. ed. Humbert 13:
206 (1948); Markgraf, Fl. Mad. fam. 169: 66, pl. 9, 8—9,
map 18 (1976).

Shrub 3 m high or tree up to 20 m high. Trunk up to 15 cm in diameter or even more; bark dark brown, rather rough, with protruding concolourous lenticels, with few white latex. Branches pale brown; branchlets subtriangular at apex, with much white latex. *Leaves* in whorls of three or opposite; petiole 1—4 mm long; blade coriaceous when fresh, subcoriaceous when dried, elliptic, 1.5—2.2 x as long as wide, 1.5—5.5 x 0.9—3.3 cm (up to 5.5 x 3.2 cm in sucker shoots), rounded or obtuse at the apex or slightly acuminate and with a blunt acumen, cuneate or rounded at the base, with 4—10 pairs of obscure rather straight secondary veins forming an angle of 50—70° with the costa; tertiary venation invisible. *Inflorescences* terminal, 1—3 together, 1—7-flowered, lax. Peduncle 3—17 mm long; pedicels 4—12 mm long. Bracts sepal-like and about half as long as the sepals. *Flowers*: *Sepals* green, ovate, 1.1—1.7 x as long as wide, 1.2—2 x 1—1.3 mm, obtuse. *Corolla* white, throat yellow-orange, with an ovoid head in the mature bud about one third of the bud length, pilose belt below the insertion of the stamens 3 mm wide; tube 6—15 x as long as the calyx, 11—23 mm long, 1—2 mm wide at the base, 2—4 mm wide around the anthers; lobes ovate, 0.4—0.5 x as long as the tube, 2—3 x as long as wide, 6—12 x 2—5.5 mm, rounded, spreading. *Stamens* with apex 0 mm below mouth of corolla tube, inserted 0.8—0.9 of the length of the corolla tube (at 9—20 mm from the base); filaments 1 mm long; anthers 3 x 1 mm. *Pistil*: ovary 2—4 x 0.8—1 x 0.6—0.8 mm, gradually narrowed into the style; pistil head of 4 parts, a basal ring 0.2 x 0.8 mm, a cylinder 0.3 x 0.3 mm, again a cylinder 0.5 x 0.5 mm and a stigmoid apex 0.3 x 0.3 mm. *Fruit* : follicles with 3 compartments, only known in immature state.

Distribution: Endemic to Madagascar.

Ecology: Montane forest. Alt. 1500—2000 m.

Specimens examined:

Madagascar. Antsiranana: Tsaratanana Mts, *Perrier de la Bâthie* 16314 (P).

Fianarantsoa: ca 3 km NE of Antoetra, a village 27 km E of Ivato, *Jongkind & Rapanarivo* 885 (WAG); *ibid.*, *Leeuwenberg & Rapanarivo* 14594 (BR, MO, P, TAN, WAG); Pic d'Ivohibe, Bara, *Humbert* 3191 (G, P, type); upper Rienana R. valley, *Humbert* 3614 (G, K, P, TAN). Toliara: Andohahela Mts, *Humbert* 6200 (P). Sin. loc., *Baron* 2458 (K, P), 5000 (K).

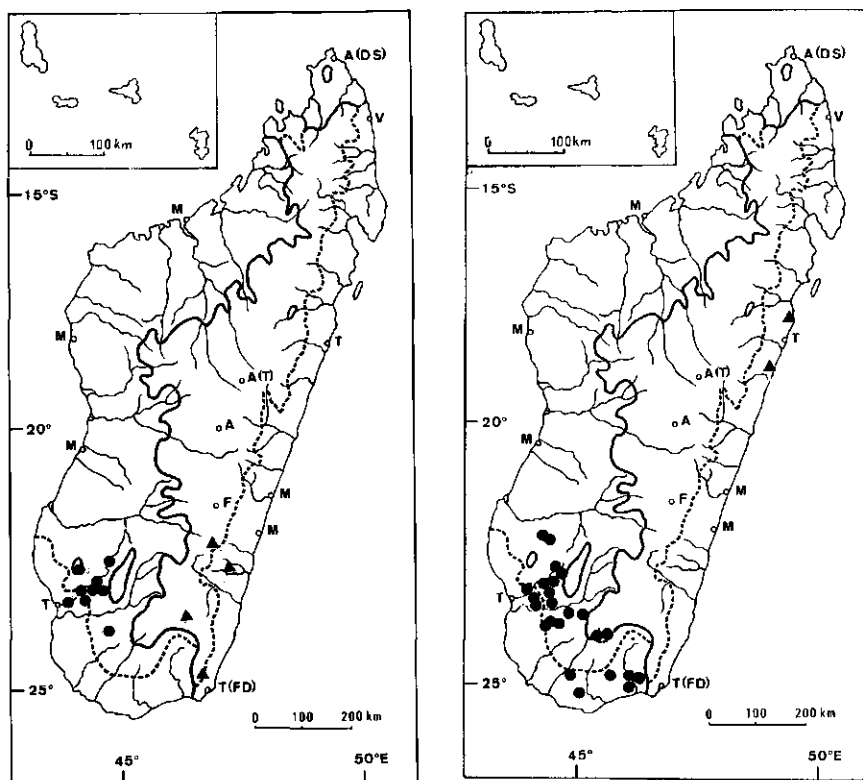
4. 8. *Petchia plectaneiiifolia* (Pichon) Leeuwenb., comb. nov.

— Type: Madagascar, Fianarantsoa, Ivohibe, *Decary* 5477 (holotype P; isotypes K, S, TAN). Fig. 11, p. 70; map 11, p. 80

Basionym: *Cabucala plecteneiiifolia* Pichon in Not. Syst. ed. Humbert 13: 206 (1948), as *plectaneiaefolia*; Markgraf, Fl. Mad. fam. 169: 77, pl. 11, 1–2, map 14 (1976).

Shrub or small tree up to 10 m high. Trunk 20–25 cm in diameter. Branches pale brown. *Leaves* opposite or in whorls of 3; petiole 1–3 mm long; blade subcoriaceous when dried, narrowly elliptic, 3–5 x as long as wide, 3–6 x 0.7–2 cm, long-acuminate at the apex, cuneate at the base, with 5–10 pairs of rather straight obscure secondary veins forming an angle of 50–60° with the costa; tertiary venation invisible. *Inflorescences* terminal, 1–3 together, 1.5–3 x 1.5–3 cm, few- to many-flowered, rather lax. Peduncle 10–20 mm long; pedicels 2–4 mm long. Bracts sepal-like, about one third as long as the sepals. *Flowers*: *Sepals* ovate or broadly ovate, 1.2–2 x as long as wide, 1–1.3 x 0.5–1 mm, obtuse or rounded, not ciliate. *Corolla* cream or white and with pale yellow tube, with an ovoid blunt head in the mature bud about one third of the bud length, pilose from the mouth to 2–3 mm below the insertion of the stamens; tube 5.3–8 x as long as the calyx, 2–2.7 x as long as the lobes, 6.5–9 mm long, 1.2–1.5 mm wide at the base, 1.5–1.8 mm wide around the anthers; lobes ovate, 0.4–0.5 x as long as the tube, 1.4–2 x as long as wide, 2.5–4.5 x 1.5–2.5 mm, rounded, entire, spreading. *Stamens* with apex 0 mm below mouth of corolla tube, inserted 0.8–0.9 of the the length of the corolla tube (at 5.3–8.3 mm from the base); filaments 0.5 mm long; anthers 2.2–3.2 x as long as wide, 1.1–1.3 x 0.4–0.5 mm. *Pistil* with apex near base of anthers; ovary 1.5–2.5 x 0.7–0.8 x 0.5–0.7 mm, gradually narrowed into the style; pistil head of a basal ring 0.2 x 0.3–0.4 mm, a globe 0.3 x 0.3 mm and a stigmoid apex 0.2 x 0.2 mm. *Fruit* unknown.

Distribution: Endemic to southeastern Madagascar.



Map 11. ▲ *Plectanella plectaneifolia*; ● *Gonioma malagassy*.

Map 12. ▲ *Plectanella longisepala*; ● *P. stenophylla*.

Ecology: Dense forest, in the mountains. Alt. up to 1700 m.

Specimens examined:

Madagascar. Fianarantsoa: Ivohibe, *Decary* 5387 (FHO, L, P), 5438 (L, P), 5477 (BM, K, P, S, TAN, type); Ankidonolava, Vondrozo, *Boiteau* 2125 (K, P, WAG). Toliara: Kalambatitra Mts, *Humbert* 11837 (C, G, K, P, WAG); Behara, *Rakotoson* RN 8173 (P, TAN).

Species excluded from *Cabucala*

Cabucala brachyantha Pichon in Not. Syst. ed. Humbert 13: 205 (1948); Markgraf, Fl. Mad. fam. 169: 73, pl. 10, 3–4, map 17 (1976). — Type: Madagascar, Toamasina, Andragoalo Mts, SE of Lake Alaotra, Onibe R. basin, Zakamena Reserve, *Humbert & Cours* 17692 (holotype P). = *Carissa campenonii* (Drake) Palacky.

5. *Plectaneia* Thou., Gen. Nov. Madag. 11 (1806); Markgraf, Fl. Madag. fam. 169: 114 (1976).

Twining lianas with white latex in all parts. Branches usually dark brown to black and with cream lenticels, smooth; branchlets terete. *Leaves* opposite, those of a pair equal, petiolate, inserted on conspicuous leaf cushions; ocreae widened into large intrapetiolar stipules; blade mostly pale green and subcoriaceous or coriaceous even when fresh, ovate or elliptic or narrowly so. *Inflorescence* terminal and often at the same time axillary and then mostly only in the axils of the upper leaves, usually shorter than the leaves and dense. *Flowers* small, 3.5—12 mm long in the mature bud. *Sepals* probably always pale green, connate at the base, erect or in dried flowers often spreading, equal or unequal, mostly ovate or narrowly so, sometimes broadly triangular, acute or obtuse, glabrous or pubescent outside, often ciliolate, glabrous or with some hairs inside, without colleters. *Corolla* white, cream or yellow, glabrous or partly puberulous outside, glabrous inside on basal 0.8—1.5 mm, with a hirsute-pubescent belt with recurved hairs just above and mostly directly below the insertion of the stamens, glabrous from the insertion of the stamens to the mouth and puberulous or glabrous on the lobes; tube almost cylindrical or less often funnel-shaped, mostly contracted below the insertion of the stamens, widened around them and again contracted at the throat, not twisted, with 5 thickenings in the throat just above the anthers; lobes ovate to very narrowly so, obtuse or rounded, mostly twisted in bud, often slightly auriculate at the left side of the base, suberect. *Stamens* included, mostly barely so; filaments very short, 0.3—0.5 mm long, filiform, glabrous; anthers ovate or broadly so, acuminate or less often obtuse at the apex, cordate at the base, glabrous. *Pistil* glabrous, with apex mostly just below base of anthers; ovary ovoid, usually laterally compressed, 2-celled; style short, rather thick; pistil head or stigma ovoid. Ovules in two rows of 5—8 in each cell. *Fruit* mostly dark brown, often with whitish indumentum, a 2-celled dry follicle, acuminate to caudate at the apex, rounded at the base, glabrous or pubescent, with 4 mostly undulate wings, septicidally dehiscent, ca 10—20-seeded, subtended by the persistent calyx; the two valves envelop the seeds. *Seed* flat, oblong, winged at both ends, glabrous; grain dark brown, obliquely elliptic or rectangular; wings light brown, obliquely rounded; funiculus long and filiform; hilum small, in the middle of one side; endosperm rather hard, thin, diaphanous, surrounding the

embryo; embryo spatulate, straight; cotyledons ovate or narrowly so, rounded at the apex and at the base; rootlet about 0.5—1 x as long as cotyledons.

The genus counts 3 species, all endemic to Madagascar.

Key to the species of *Plectaneia*

1. Leaves rather large and with ca 30 rather straight secondary veins, 6—11 cm long; sepals 6 x as long as wide, 3 x 0.5 mm. East Madagascar.....1. ***P. longisepala***
 Leaves mostly smaller, with 5—20 pairs of obscure or anastomosing secondary veins; sepals up to 4 x as long as wide.....2
2. Leaves 5—8 x as long as wide, obtuse or rounded at the apex; corolla glabrous outside. South Madagascar.....
2. ***P. stenophylla***
 Leaves, if more than 5 x as long as wide, acuminate at the apex and corolla mostly puberulous outside.....1. ***P. thouarsii***

5. 1. *Plectaneia longisepala* Markgr. in *Adansonia* II, 12: 585 (1972); Fl. Madag. Fam. 169: 122, pl. 17, 10—11 (1976). — Type: Madagascar, Toamasina, near Ambila-Lemaitso, *Decary* 6547 (holotype P). Fig. 13, p. 83; map 12, p. 80

Liana. Branches pale brown, with concolourous lenticels; branchlets glabrous. *Leaves*: petiole 6—10 mm long, glabrous; blade coriaceous when dried, elliptic, 1.3—3 x as long as wide, 6—11 x 2.5—8 cm, apiculate at the apex with a blunt acumen, cuneate or rounded at the base, glabrous on both sides, with ca 30 pairs of rather straight secondary veins, (3—5 x 1—1.2 cm and with inconspicuous venation on lateral branchlets bearing flowers), tertiary venation invisible. *Inflorescence* at least 4 x 2 cm, lax at least in first branchings. Peduncle at least 2 cm long, glabrous; pedicels 1—3 mm long or more, glabrous. Bracts leafy or sepal-like. *Flowers*: *Sepals* pale green, connate at the base for 0.2 mm, equal, very narrowly ovate, 3 x 0.5—0.7 mm, acute, glabrous on both sides. *Corolla* (in bud only), 2—3 mm long, glabrous or sparsely puberulous outside, glabrous inside (probably too young to

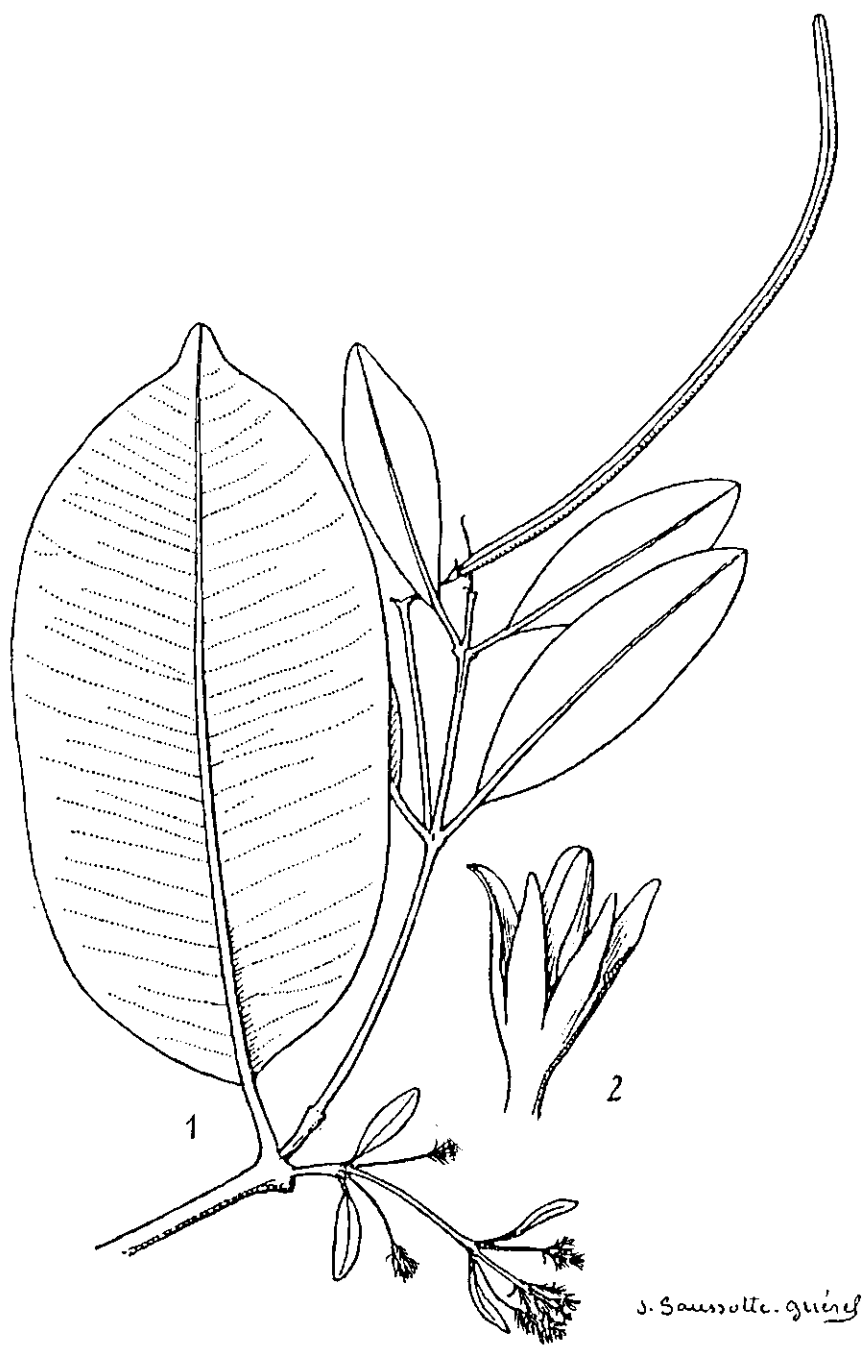


Fig. 13. *Plectaneia longisepala*. 1, habit (x 1.6); 2, flower bud (x 12). 1-2 from Decary 6547.

have developed any indumentum); tube 0.5 mm long; lobes narrowly ovate, 1.5 x 0.7 mm, obtuse. *Stamens* barely included; anthers 0.5 x 0.3 mm. *Fruit* immature.

Distribution: Only collected twice.

Ecology: Coastal forest on sand. Alt. 0-10 m.

Second specimen known:

Madagascar. Toamasina, Analalava Forest, near Foulpointe, *Leeuwenberg & Rapanarivo* 14475 (BR, MO, P, TAN, WAG).

5. 2. *Plectaneia stenophylla* Jum. in Ann. Mus. Colon. Marseille V, 2: 27 (1934); Markgraf, Fl. Mad. fam. 169: 126, pl. 18, 5-7 (1976). — Type: Madagascar, Toliara, Upper Fiheranona R. valley, *Perrier de la Bâthie* 16669 (lectotype P, designated by Markgraf; isolectotype WAG). Fig. 14, p. 85; map 12, p. 80

Small liana, 2-3 m high climbing or more. Branches dark brown, with whitish lenticels; branchlets glabrous. *Leaves*: petiole glabrous, 1-3 mm long; blade dark green above, pale green beneath, brittle and papery when dried, very narrowly elliptic or ovate, 5-8 x as long as wide, (often wider in leaves near bases of branchlets), 1-5 x 0.2-1 cm, obtuse or rounded at the apex, cuneate or rounded at the base, glabrous on both sides, venation invisible. *Inflorescence* terminal and often at the same time in the axils of the upper leaves, 1-1.5 x 1-2 cm, many-flowered, rather dense. Peduncle 1-2 mm long, glabrous; pedicels 1-3 mm long, glabrous. Bracts sepal-like and 0.5-1 x as long as them. *Flowers*: *Sepals* pale green(?), connate at the base for 0.2 mm, ovate or narrowly ovate, 2-2.5 x as long as wide, 1-1.6 x 0.5-0.8 mm, obtuse or acute, glabrous on both sides, ciliolate. *Corolla* yellow or greenish-yellow, 5-7.5 mm long in the mature bud, glabrous outside, glabrous inside at basal 1 mm, hairy belt 0.5-0.7 mm wide, otherwise glabrous; tube 1.5-2 x as long as the longest sepal, 0.36-0.7 x as long as the lobes, 2-2.8 mm long, almost cylindrical and 0.6-0.9 mm wide, widened around the stamens to 0.8-1.2 mm wide, contracted at the throat; lobes very narrowly ovate, 1.4-2.7 x as long as the tube, 3-4.6 x as long as wide, 3.5-5.5 x 0.8-1.2 mm, obtuse, twisted in bud. *Stamens* with apex 0-0.5 mm below mouth of corolla tube, inserted 0.6-0.75 of the length of the corolla tube, (at 1.5-1.7 mm from the base); anthers 0.5 x 0.2-0.3 mm. *Pistil*, 1.4-1.6 mm long; ovary laterally compressed,

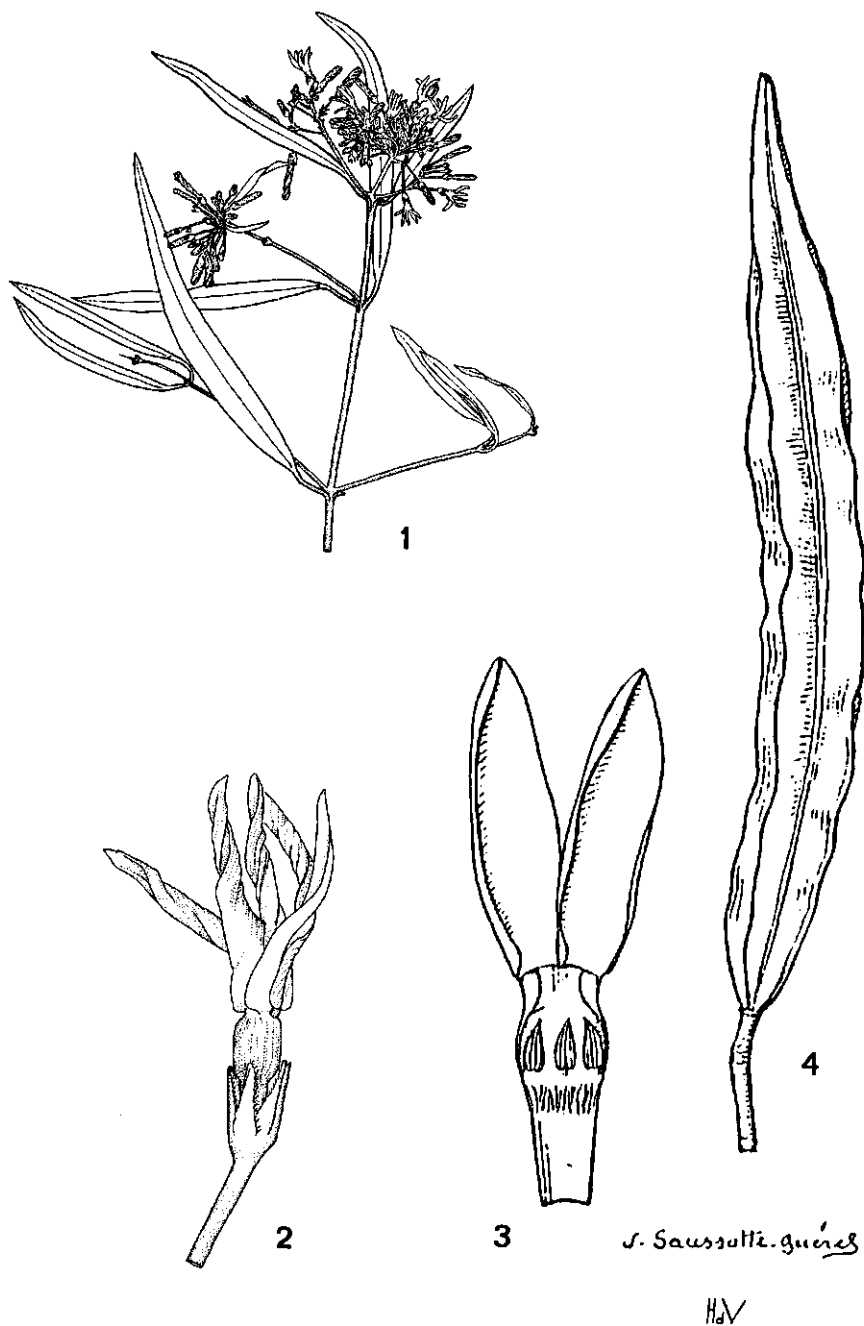


Fig. 14. *Plectaneia stenophylla*. 1, habit (x 1); 2, flower (x 8); 3, opened corolla (x 10); 4, fruit (x 1). 1-2 from Humbert 12945; 3-4 from Bosser 9170.

0.8—1 x 0.5—0.8 x 0.3—0.5 mm; style 0.2—0.4 mm long; pistil head or stigma 0.3—0.4 x 0.2 mm. Ovules in rows of ca 7. *Fruit* dark brown, 6—13 x 0.7—1 cm, glabrous; wings more or less undulate. *Seed* 15 x 3—4 mm; grain almost square, 5 x 3—4 mm.

Distribution: Endemic to southern Madagascar.

Ecology: Dry open forest or bush. Alt. 150—400 m (or less).

Geographical selection of the approximately 40 specimens examined:

Madagascar. Toliara: near left bank Fiherenana R., 32 km from Tulear, *Leeuwenberg & Rapanarivo* 14627 (BR, K, MO, P, TAN, UPS, WAG); upper Fiherenana R. valley, *Humbert* 5090 (P, WAG); *ibid.*, *Perrier de la Bâthie* 16669 (P, WAG, lectotype); Ankazoabo, *Bosser* 17359 (P, TAN, WAG); Sakaraha, *Bosser* 9170 (K, P, TAN, WAG); *ibid.*, Lambomakondro, *Decary* 18883 (P), 18892 (P); Andranohinaly, *SF* 13067 (P, TEF, WAG); 23–43 km E of Tulear, along road to Andranovory, *Croat* 31029 (K, P, TAN, WAG); 30 km S of Sakaraha, *Morat* 3510 (P, TAN); Sakaraha-Tongobory Path, *Morat* 2451 (P, TAN); km 45 Itampolo-Ejeda Road, *Liede et al.* 2718 (MO, P); Isalo, near Fanjahira, *Humbert* 2790 (G, P); Itambono Corridor, 15 km W of junction with Nat. Road 10, *Phillipson & Rabesihanaka* 3128 (BR, K, P, TAN, WAG); lower Onilahy R. basin, near Betioky, *Humbert & Swingle* 5257 (P); Beza Mahafaly Reserve, near Betioky, *Phillipson* 1829 (BR, C, K, P, TAN, WAG); 16 km SW of Ampanihy, *Labat et al.* 2071 (K, P); Onilahy R., near Benenitra, *Perrier de la Bâthie* 12725 (P, WAG); near Beloha, *Croat* 31499 (C, K, WAG); *ibid.* *Decary* 4 Sept. 1917 (GB, P), 6 Sept. 1917 (P); between Bekily and Tsivory, *Seyrig* 106 bis (P); Ambovombe, *Decary* 8489 (BM, K, P, TAN, US), 8586 (P, S); SW of Ambovombe, Kotoala, *Decary* 9098 (NY, P, UC); Mandrare R. valley, near Ambovombe, *Humbert & Swingle* 5627 (G, P, US); Antanimora, *Decary* 2933 (C, G, P), 9556 (BM, P, US); Manambolo R. valley, near Isomono, *Humbert* 12945 (G, K, P, TAN, US); SW of Ifotaka, *Lam & Meeuse* 5479 (L, P); Berenty Reserve, *Phillipson* 2308 (BR, K, P, TAN, WAG); Manambolo R. valley, NW of Maroamby, *Humbert* 12751 (P, WAG).

5. 3. *Plectaneia thouarsii* Roem. & Schult., Syst. Veg. 4: 420 (1819); Markgraf, Fl. Madag. Fam. 169: 129, pl. 19, 1—6 (1976).

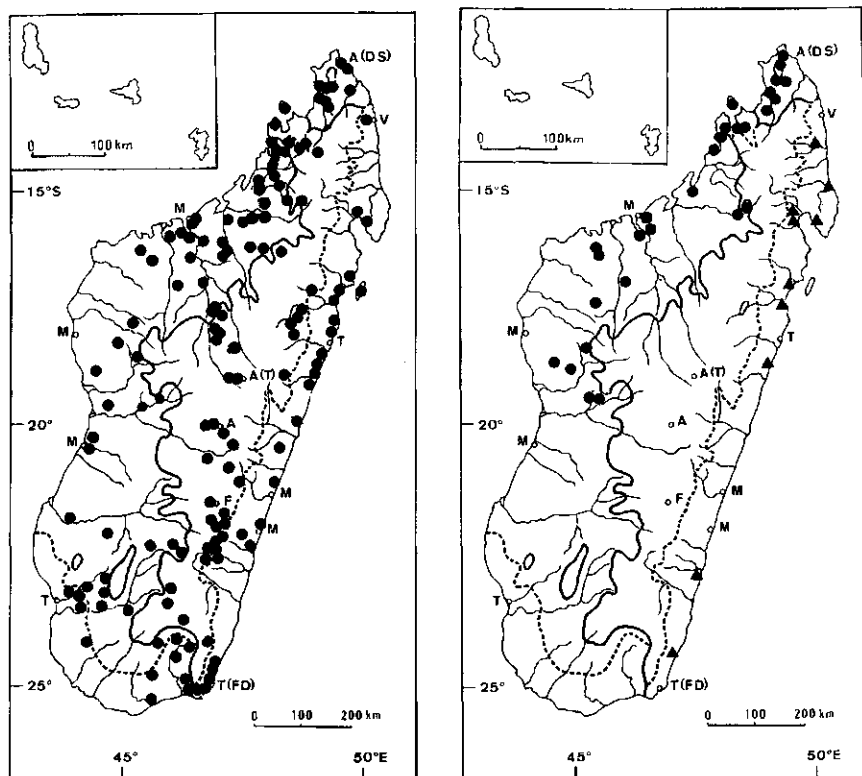
— Type: Madagascar, sin. loc., Du Petit-Thouars s.n. (holotype P).
Fig. 15, p. 87; phot. 8, p. 124; map 13, p. 88

Homotypic synonym: *P. volubilis* Poir. in Lamarck, Tabl. Enc. 2: 306 (1819).

Heterotypic synonyms: *P. hildebrandtii* K. Schum. in Engler & Prantl, Nat. Pflanzenf. 4 (2): 144 (1895); Markgraf, op. cit. 118, pl. 17, 1—5, **syn. nov.** — Type: Madagascar, Antsirana, Pasandava (= Ampasindava) Bay, Kisimani, *Hildebrandt* 3012 (holotype B†; lectotype K, designated here; isotypes BREM, G, M, P, W).



Fig. 15. *Plecteneia thouarsii*. 1, habit (x 1); 2, intrapetiolar stipules (x 12); 3, flower (x 12); 4, sepal inside (x 27); 5, corolla (x 12); 6, opened corolla (x 12); 7, pistil (x 12); 8, fruit (x 1). 1-2 from Leeuwenberg 14186; 3-7 from Leeuwenberg 14177; 8 from Humbert 28941.



Map 13. *Plectaneia thouarsii*.

Map 14. ▲ *Stephanostegia capuronii*; ● *S. hildebrandtii*.

- ? ?*P. pervillei* K.Schum., l. c. — Type: Madagascar, *Perville* 509 (holotype not traced).
- P. rhomboidalis* Jum. & Perr. in *Le Caoutchouc et la Gutta-Percha* 15 Février 1908: 9 (1908); in *Ann. Mus. Colon. Marseille II*, 6: 46, t. 1 (1908); Markgraf, op. cit. 121, pl. 17, 6-9, **syn. nov.** — Type: Madagascar, Mahajanga, Ankara Plateau, Bemaimbo, *Perrier de la Bâthie* 8939 (holotype P; isotype K).
- P. hildebrandtii* f. *hirsuta* Jum. & Perr. in *Ann. Mus. Colon. Marseille II*, 6: 46 (1908); Markgraf, op. cit. 120, **syn. nov.** — Type: Madagascar, Mahajanga, Menavava R. valley, *Perrier de la Bâthie* 1130 (holotype P; isotype WAG).
- P. inutilis* Jum. & Perr. in op. cit. 49, f. 2-5 and 6B (1908).
P. elastica var. *inutilis* (Jum. & Perr.) Markgr., op. cit. 134, pl. 20, 6-7, **syn. nov.** — Type: Madagascar, Mahajanga, Boina, surroundings of Ampanihy, near Ampasimentera, *Perrier de la Bâthie* 8943 (holotype P; isotype K).

- P. inutilis* f. *latiflora* Jum. & Perr. in op. cit. 56. — Type: Madagascar, Mahajanga, Upper Bemarivo R., *Perrier de Bâthie* Nov. 1907 (holotype P).
- P. elastica* Jum. & Perr. in op. cit. 56, t. 2, f. 6A and 7–9; Markgraf, op. cit. 132, pl. 20, 1–5. — Type: Madagascar, Mahajanga, Upper Bemarivo R. basin, Analamahitso Forest, *Perrier de la Bâthie* 2 (lectotype P, designated here; isolectotype K).
- P. elastica* f. *firingalavensis* Jum. & Perr. in Ann. Mus. Colon. Marseille II, 6: 64, fig. 1 (1908). *P. firingalavensis* (Jum. & Perr.) Jum. in Ann. Mus. Colon. Marseille V, 2: 18 (1934); Markgraf, op. cit. 127, pl. 18, 8–9, **syn. nov.** — Type: Madagascar, Mahajanga, Firingalava Forest, Ikopa R., between Maevatanana and Andriba, *Perrier de la Bâthie* 351 (holotype P; isotypes K, WAG).
- P. microphylla* Jum. & Perr. in Agric. Prat. Pays Chauds 10: 189 (1910); Markgraf, op. cit. 139, pl. 19, 14–17, **syn. nov.** — Type: Madagascar, Antsiranana, Sambirano R. valley, *Perrier de la Bâthie* 18626 (holotype P).
- P. boivinii* Jum. in Ann. Mus. Colon. Marseille V, 2: 22 (1934), as *boivini*; Markgraf, op. cit. 122, pl. 18, 1–2., **syn. nov.** — Type: Madagascar, Mahajanga, Upper Isandrano R., tributary of Ikopa R. left bank, *Perrier de la Bâthie* 8940 (holotype P).
- P. inutilis* var. *hirsuta* Jum. in op. cit. 36; *P. elastica* var. *inutilis* f. *hirsuta* (Jum.) Markgr. in Adansonia II, 12: 221 (1972) and op. cit. 136, **syn. nov.** — Type: Madagascar, Antsiranana, Ambohipiraka, *Perrier de la Bâthie* 18749 (lectotype P, designated here, cited as holotype by Markgraf (1976)).
- P. isalensis* Jum. in op. cit. 40; Markgraf, op. cit. 137, pl. 19, 9–13, **syn. nov.** — Type: Madagascar, Fianarantsoa, Isalo, *Perrier de la Bâthie* 16559 (lectotype P, designated here, cited as holotype by Markgraf).
- P. isalensis* f. *glomerata* Jum. in op. cit. 42. — Type: Madagascar, Fianarantsoa, W of Fianarantsoa, *Perrier de Bâthie* 12877 (lectotype P, designated here).
- P. microphylla* var. *tsaratanensis* Jum. in op. cit. 44; Markgraf, op. cit. 129, pl. 20, 10–12. *P. tsaratanensis* (Jum. & Perr.) Pichon in Mém. Mus. natn. Hist. Nat. II, 27: 194 (1949("1948")), **syn. nov.** — Type: Madagascar, Antsiranana, Mt Tsaratanana, *Perrier de la Bâthie* 11701 (lectotype P, designated here; erroneously cited as holotype by Markgraf).

- P. macrocarpa* Jum. in op. cit. 46. *P. thouarsii* var. *macrocarpa* (Jum.) Markgr. in *Adansonia* II, 12: 222 (1972) and op. cit. 130, pl. 19, 7-8, **syn. nov.** — Type: Madagascar, Fianarantsoa, Lower Matitana R. basin, *Perrier de Bâthie* 8197 (lectotype P, designated here, cited as holotype by Markgraf).
- P. lanceolata* Pichon in Not. Syst. ed. Humbert 13: 207 (1948). *P. firingalavensis* var. *lanceolata* (Pichon) Markgr. in *Adansonia* II, 12: 221 (1972) and op. cit. 129, pl. 18, 10-11, **syn. nov.** — Type: Madagascar, Toliara, Miandrivazo District, Dabolava, *Decary* 15233 (holotype P; isotype K).
- P. breviloba* Markgr., l.c. and op. cit. 124, pl. 18, 3-4, **syn. nov.** — Type: Madagascar, Toamasina, Rahobevava, *Cours* 4276 (holotype P; isotype TAN).
- P. firingalavensis* f. *setulosa* Markgr., l.c.; *P. firingalavensis* var. *firingalavensis* f. *setulosa* (Markgr.) Markgr., op. cit. 128, **syn. nov.** — Type: Madagascar, Toliara, Zombitsy Forest, NE of Sakaraha, *Leandri & Rakoto* 3895 (holotype P).
- P. elastica* var. *insularis* Markgr., l.c. and op. cit. 137, pl. 20, 8-9, **syn. nov.** — Type: Madagascar, Antsiranana, Nosy Be, *Pervillé* 703 (holotype P; isotype K).

Liana climbing 1-10 m high, 5-20 m long. Trunk 1-6 cm in diameter; bark dark grey or dark brown to black, smooth or rough and longitudinally and often at the same time transversely fissured, mostly with cream lenticels. Branches dark brown, with cream lenticels; branchlets glabrous or sometimes only near apex puberulous or pubescent. *Leaves*: petiole glabrous or sometimes pubescent, 1-9 mm long; blade herbaceous to coriaceous when fresh, membranaceous to coriaceous when dried, ovate, elliptic or narrowly so, variable in shape and size, 1.4-6 x as long as wide, 1-8.5 x 0.5-4.7 cm, acuminate or less often obtuse at the apex, rounded or cuneate at the base, often suborbicular and rounded or retuse at the apex in leaves at the base of the branchlets, glabrous or rarely pubescent on both sides, sometimes with scattered black dots beneath, with 5-20 pairs of secondary veins which are mostly inconspicuous; tertiary venation mostly invisible, otherwise reticulate. *Inflorescence* paniculate, dense, especially in last branchings, very variable in size, 0.7-7.5 x 1-6 cm, mostly many-flowered. Peduncle 0-5 cm long, glabrous, pubescent or puberulous; pedicels 0.5-5 mm long, glabrous, pubescent or puberulous. Bracts sepal-like and 0.3-2 x as long as the sepals. *Flowers*: *Sepals* pale green,

connate at the base for 0.1–0.67 of their length, 1.2–4 x as long as wide, 1–3 x 0.5–1 mm or forming a more or less tubular calyx 1.2–1.8 x 1.5 mm with lobes unequal, ovate to triangular or broadly or narrowly so, 0.8–1.3 x as long as wide, 0.4–0.8 x 0.4–0.8 mm, obtuse to acuminate, pubescent, glabrous or sparsely puberulous outside, ciliolate, glabrous or partly puberulous inside, without colleter. *Corolla* white, cream or pale yellow, tube often greenish or pale green, 3.5–10(–12) mm long in the mature bud, puberulous or sparsely so outside, less often entirely glabrous, glabrous inside on basal 0.8–1.5 mm, hairy belt 0.5–1 mm wide, entirely glabrous from there or from above the insertion of the stamens to the mouth and puberulous or sometimes sparsely so on the lobes; tube 0.7–4 x as long as the longest sepal, 0.17–2 x as long as the lobes, 2–4 mm long, obconical or almost cylindrical, 0.5–1 mm wide above the base, often slightly contracted below the insertion of the stamens, widened around them to 0.8–1.5 mm wide; lobes ovate or narrowly so to even strap-shaped, 0.5–2.5 (–5) x as long as the tube, 1–6(–12) x as long as wide, 1–8 (–10) x 0.5–1.5 mm, obtuse or rounded, mostly suberect, twisted in bud. *Stamens* with apex 0–0.8 mm below mouth of corolla tube, inserted 0.5–0.8 of the length of the corolla tube, (at 1.5–2.5 mm from the base); anthers 1.7–2.7 x as long as wide, 0.3–0.8 x 0.2–0.4 mm. *Pistil* 1.5–3 mm long; ovary laterally compressed, 0.6–1 x 0.4–0.8 x 0.3–0.6 mm; style 0.3–2 mm long; pistil head or stigma 0.3–0.5 x 0.2–0.3 mm. Ovules in rows of 5–8. *Fruit* dark brown or less often pale grey-brown, 7–37 x 0.5–1.5 cm, glabrous or pubescent, wings mostly undulate. *Seed* 11–40 x 3–8 mm; grain obliquely oblong, 5–15 x 3–8 mm; wings equal or unequal; embryo 4–13 mm long; cotyledons 2–10 x 1–4 mm; rootlet 1–3.5 x 0.5–0.7 mm.

Distribution: Endemic to Madagascar.

Ecology: Light, mostly rather dry forest or woodland. Alt. 0–1500 m.

Geographical selection of the approximately 340 specimens examined:

Madagascar. Mahajanga: Betsiriry, Herb. Jard. Bot. Tana. 6203 (TAN); Antsalova District, *Ramarokoto* RN 12479 (P, WAG); 3 km N of Andrananidahy, 15 km ESE of Antsalova, *Villiers & Badré* 5021 (MO, P); near Ambodiriana, *Leandri & Saboureaux* 2667 (K, P, WAG); Ankara Plateau, Bemaimbo, *Perrier de la Bâthie* 8939 (K, P, type of *P. rhomboidalis*); Mahatsinjo, *Perrier de la Bâthie* 15902 (P); upper Isandrano R., tributary of Ikopa R., *Perrier de la Bâthie* 8940 (P, type of *P. boivini*); Firingalava Forest, Ikopa R. right bank, between Maevatanana

and Andriba, *Perrier de la Bâthie* 351 (K, P, WAG, type of *P. elastica* f. *firingalavensis*), 351 bis (P); Ankara Mts, *Decary* 14543 (K, P, TAN); Amboromalandy, *Bosser* 8457 (P, TAN); Menavava R. valley, *Perrier de la Bâthie* 1130 (P, WAG, type of *P. hildebrandtii* f. *hirsuta*); Namoroka Reserve, *Decary* 15746 (K, P, WAG); Andranomavo, *Rakotovo* RN 5328 (TAN); Madirovalo, *Perrier de la Bâthie* 8194 (P); Betsiboka R. valley, near Mananika, *Humbert & Perrier de la Bâthie* 2132 (P); Boina, *Perrier de la Bâthie* 2351 (P); Ankarafantsika Reserve, *Perrier de la Bâthie* 8837 (P), 13224 A (L, P), 13224 B (P); *ibid.*, SF 2269 (P, TAN); *ibid.*, Ampijoroa, *Boiteau* 1030 (P, WAG); *ibid.*, *Dorr & Koenders* 2956 (K, P, TAN, WAG); upper Bemarivo R., *Perrier de la Bâthie* Nov. 1907 (P, type of *P. inutilis* f. *latiflora*); Analamaitso Forest, *Perrier de la Bâthie* 2 (K, P, lectotype of *P. elastica*), 8941 (P), 1 Aug. 1908 (K), Dec. 1910 (P); Boina, surroundings of Ampanihy, near Ampasimentera, *Perrier de la Bâthie* 8943 (K, P, type of *P. inutilis*); near Marovoay, *Humbert & Perrier de la Bâthie* 2356 (A, B, G, K, P, TAN), 8850 (P), 13237 (P), 13238 (P), 13239 A (P), 13239 B (P), 16819 (P, WAG), 17802 (P); Ste. Marie de Marovoay, *Kaudern* 17 June 1912 (S); Mahavavy R., *Perrier de la Bâthie* Sept. 1910 (G); near Bombetoka, *Perrier de la Bâthie* June 1908 (P); near Mahajanga, *Perrier de la Bâthie* May 1908 (P), 17805 (P, WAG); N of Mahajanga, *Barnett et al.* 481 (K, MO, P, TAN, WAG); *ibid.*, *Dorr* 3827 (BR, K, P, TAN, US, WAG); Mahajamba, Bemarivo R., *Perrier de la Bâthie* 8938 (P); lower Sofia R., *Decary* 14884 (P, TAN); Befandriana, *Rauh* 912 (TAN); *ibid.*, Ambilomavo, *Herb. Jard. Bot. Tana.* 5415 (TAN); 4 km W of Port Berge, *Leeuwenberg & Rapanarivo* 14707 (BR, MO, P, TAN, WAG); 1 km E of Ambalafamainty, *Leeuwenberg & Rapanarivo* 14713 (BR, MO, P, TAN, WAG); 10 km N of km 7 Befandriana Nord-Antsohihy, 1 km S of Andranova, *Leeuwenberg & Rapanarivo* 14768 (BR, MO, P, TAN, WAG); km 17 Ankarika-Analalava, *Leeuwenberg & Rapanarivo* 14744 (BR, MO, P, TAN, WAG); km 33 of same road, *Leeuwenberg & Rapanarivo* 14739 (BR, MO, P, TAN, WAG); Bora Mts, between Antsohihy and Antsahabe, SF 31610 (= 1157-R-187) (TEF); 30 km E of Antsohihy, *Gentry* 11544 (K, P, TAN, WAG); km 82 Antsohihy-Ambanja, between Andrafiabe and Andranosamonta, *Leeuwenberg & Rapanarivo* 14747 (BR, MO, P, TAN, WAG); Maromandia, *Decary* 1254 (P), 1258 (BM, P); *ibid.*, Bejofo, *Decary* 2089 (P). Antsiranana: Sambirano R. valley, *Perrier de la Bâthie* 15507 (P), 18626 (P, type of *P. microphylla*); between Akaramikely and Moramandia, *Rabevohitra* SF 29565 (TEF); Manongarivo Mts, *McPherson* 16402 (TAN); Mt Tsaratanana, *Perrier de la Bâthie* 11701 (P, lectotype of *P. microphylla* var. *tsaratanensis*), 15212 (P, paratype of *P. m.* var. *tsaratanensis*); Pasandava (= Ampasindava) Bay, *Hildebrandt* 3012 (G, K, M, P, W, type of *P. hildebrandtii*); Nosy Be, *Boivin* 17 (P); *ibid.*, *Pervillé* 440 (L, P), 703 (G, K, P, type of *P. elastica* var. *insularis*), 768 (P); *ibid.*, *Richard* 269 (FI-W, TCD), 327 (K, TCD), 337 (P), 343 (P, TAN); *ibid.*, Lokobe Reserve, *Bernardi* 11820 (G, K, L, P, Z); Nosy Be, near Antafondro, *Bernardi* 11903 (G, K, L, P, Z); Ankarana Reserve, *Harder et al.* 1758 (P, TAN, WAG), 1765 (P, TAN, WAG); *ibid.*, *Humbert* 18965 (G, P), 18996 (G, K, P, TAN); *ibid.*, *Leeuwenberg et al.* 14257 (BR, MO, P, TAN, WAG), 14395 (BR, MO, P, TAN, WAG); Orangea Forest, SE of Ranomena, *Leeuwenberg et al.* 14407 (TAN, WAG), 14414 (BR, MO, P, TAN, WAG); Diego-Suarez, *Perrier de la Bâthie* 17775 (P); Mt des Français, *Keraudren* 1647 (P, WAG); *ibid.*, *Leeuwenberg et al.* 14399 (BR, MO, P, TAN, WAG), 14400 (BR, MO, P, TAN, WAG), 14402 (BR, MO, P, TAN, WAG); *ibid.*, *Poisson* 92 (P); Marovato, Anivorano-Nord, *Humbert* 32411 (P, WAG); upper Loky R. basin, *Perrier de la Bâthie* 8930 (P, paratype of *P. inutilis* var. *hirsuta*); Ambilobe, *Waterlot* 357 (P, paratype of *P. i.* var. *hirsuta*), 402 (P, paratype of

P. i. var. hirsuta); near Ambohipiraka, *Perrier de la Bâthie* 18749 (P, lectotype of *P. i. var. hirsuta*); between Vohemar and Ambilobe, *Decary* 14612 (P); Vohemar, *Boivin* 2463 (P); Marojeje Res., *Ravelonarivo et al.* 225 (WAG). Antananarivo: Manerinerina, *Perrier de la Bâthie* 16846 (P); Manankazo, *Bosser* 7889 (P); *ibid.*, *Harizo* RN 1206 (P); *ibid.*, *Perrier de la Bâthie* 11311 (P); Ambohitantely, *Rakotozafy* 1284 (TAN); km 21 Ankazobe-Maevatanana, *Leeuwenberg & Rapanarivo* 14662 (BR, MO, P, TAN, WAG); km 44 Antananarivo-Mahajanga Road, *Bosser* 16259 (TAN); Ankitsika Forest, Ambohijanaka, *Cours* 1580 (P, TAN); Ambohimasina, W of Betafo, *Perrier de la Bâthie* 13951 (P); Mt Ibity, *Perrier de la Bâthie* 13578 (P). Toamasina: Maroantsetra, *Mocquerys* 497 (P); Masoala Peninsula, ca 11 km S of Ambanizana, *Schatz & Modeste* 3097 (K, P, TAN, WAG); Soanierana-Ivongo, SF 2314 (P, TAN, TEF), 2357 (P); Vatomandry District, *Guillot* 45 (G, K); Lake Alaotra, Maningory R. Falls, *Homolle* 555 (P); Antandrokomby, *Peltier* 965 (P, TAN); Ambatondrazaka, *Decary* 16466 (P, TAN); Rahobevava, *Cours* 4276 (P, TAN, type of *P. breviloba*); Île Ste. Marie, *Boivin* 13 (P); Tampolo Forest, *Leeuwenberg* 13746 (BR, P, WAG), 14467 (TAN, WAG); Sahatavy, *Ramarokoto* RN 10112 (P); *ibid.*, *Laibosaka* RN 11364 (P); road to Analalava, W of Foulpointe, *Dorr & Barnett* 3318 (BR, C, K, NY, P, S, TAN, US, WAG); Analalava Forest, *Leeuwenberg* 13756 (K, P, WAG), 14472 (BR, MO, P, TAN, WAG); near Tamatave, *Perrier de la Bâthie* 8876 (P); Tampina, *Perrier de la Bâthie* 13306 (P); near Ambila-Lemaitso, *Leeuwenberg & Ranaivojaona* 14582 (BR, MO, P, TAN, WAG), 14586 (BR, MO, P, TAN, WAG); *ibid.*, *Lowry & Randrianasolo* 4549 (BR, TAN, WAG); *ibid.*, *Schatz & Armbuster* 3146 (K, P, TAN, WAG); Analamazaotra Forest, *Boiteau* 493 (K, P, WAG); 11 km E of Perinet, *Morat* 3891 (TAN), 3892 (TAN); Ampitambe, SF 32366 (= 1137-R-631) (TEF); near Mahanoro, *Perrier de la Bâthie* 14191 (P), 18110 (P). Fianarantsoa: near Ambatofindrahana, *Cremers* 3648 (P, TAN, WAG); *ibid.*, *Decary* 13132 (P), 13292 (P); 39 km N of Ambositra, along Nat. Road 7, *Croat* 29465 (P, TAN); near Kianjadrakefona, *Leeuwenberg et al.* 14429 (BR, MO, P, TAN, WAG); Nosy-Varika, SF 19769 (P, TEF); Mananjary, *Geay* 8146 (P), 8147 (P); Ranomafana Reserve, *Leeuwenberg et al.* 14153 (BR, K, TAN, WAG), 14154 (BR, K, TAN, WAG); W of Fianarantsoa, *Perrier de la Bâthie* 12877 (P, lectotype of *P. isalensis f. glomerata*); Ramiova, Ambalavao, *Rakotovo* RN 7627 (P); Vohimaso, Mahazony, *Rakotovo* 540 (P); km 14 Ambalavao-Ihosi Road, near Ampitaha, *Leeuwenberg & Rapanarivo* 14608 (BR, MO, P, TAN, WAG); near Sakaso, along Ihosi-Analalira Road, *Allorge & Veyret* 596 (P, WAG); Vohibory Mts, W of Ivohibe, *Humbert* 3127 (G, P); Sendrisoa, *Rakotoson* RN 11497 (P, TAN); Pic d'Ivohibe, *Humbert* 3135 (BM, P); Vohipeno, *Beaujard* 261 (P); Ampasy, Ivongo, *Rakotovo* 589 (P); upper Rienana R. valley, *Humbert* 3592 (G, K, P, WAG); lower Matitanana R. valley, *Perrier de la Bâthie* 8136 (P), 8137 (P), 8197 (P, lectotype of *P. macrocarpa*); Andringitra Reserve, *Rakoto* RN 1383 (P); W of Andringitra Mts, *Perrier de la Bâthie* 13735 (P); Tsiazomborona, Ivohibe, *Boiteau* 2064 (P); Itempona R., SW of Ihosi, *Mabberley* 900 (TAN), 904 (TAN); Ankibory, Ambalavao, *Rakotovo* RN 7592 (P). Toliara: near Ambanihaz, *Geay* 6774 (P); Mandena Forest, *Leeuwenberg et al.* 14204 (BR, K, P, TAN, WAG); *ibid.*, *Rabevohitra et al.* 1795 (K, P, TAN, WAG); *ibid.*, *Zarucchi et al.* 7495 (F, P, TAN, WAG); Manantantely Forest, *Boiteau* 3076 (P, WAG); near Fort-Dauphin, *Scott Elliot* 2289 (K, P), 2584 (K, P); *ibid.*, Pic St. Louis, *Leeuwenberg et al.* 14198 (BR, K, TAN, WAG), 14199 (BR, K, P, TAN, WAG); Petriky, *Rabevohitra et al.* 1809 (K, P, TAN, WAG); W of Ranopisa, *Leeuwenberg* 14158 (BR, K, P, TAN, WAG); Andohahela Reserve, Parcelle 2, *Leeuwenberg et al.* 14159 (BR, K, P, TAN, WAG), 14164 (BR, K, P, TAN, WAG), 14172 (BR, K,

P, TAN, WAG), 14177 (BR, K, P, TAN, WAG); Parcelle 3, *Leeuwenberg* et al. 14182 (BR, K, P, TAN, WAG), 14186 (BR, K, P, TAN, WAG); upper Mandrare R. basin, between Vavara Pass and Manambolo R. valley, *Humbert* 6747 (G, P); NE of Vohitsiombe, *Decary* 4569 (C, P); Imanombo, *Bosser* 10255 (P, TAN); Sakamalio R. valley, tributary of Manambolo R., *Humbert* 13346 (G, K, P); Ampandrandava, between Bekily and Tsivory, *Seyrig* 106 (P); Mangoky, Andranomiforitra R. valley, *Humbert* 7068 bis (P); 20 km N of Betroka, along Nat. Road 13, *Phillipson* et al. 3937 (TAN, WAG); Vohipolaka Mt, *Humbert* 11670 (P, TAN); Sakalalina Road, *Descoings* 3708 (P, TAN); Onilahy R., near Benenitra, *Perrier de la Bâthie* 12716 (P), 17365 (P); Bereketa, *Peltier* 2783 (P, TAN); Antanimora, *Decary* 8868 (BM, G, P, S, US); Tsiombe-Ambondro Road, *Croat* 31671 (TAN); Marovato-Tsiombe Road, *Croat* 31597 (TAN); Mahafaly Plateau, near Beomby, *Keraudren* 798 (K, P, WAG); Fiherenana R. basin, *Perrier de la Bâthie* 16599 (P); km 56 Sakaraha-Anjamala Road, *Chauvet* 431 (P, WAG); between Tulear and Miary, *Bosser* 10417 (P, TAN, WAG); Sakaraha, *Bosser* 9171 (P, TAN); *ibid.*, *Decary* 14101 (GB, P); Zombitsy Forest, *Bosser* 13872 (P, TAN), 13884 (P, TAN); *ibid.*, *Croat* 30672 (P, TAN); Analamarina Forest, Hazoroa R. valley, S of Sakaraha, *Humbert* 19645 (K, P, WAG); Ankazoabo, *Bosser* 17320 (P, TAN, WAG); N of Tulear, near Lake Ihotry, *Phillipson* 3076 (BR, K, P, TAN, WAG); Morondava, *Humbert & Perrier de la Bâthie* 2391 (B, P); *ibid.*, *Rakotozafy* 1087 (TAN); Marofandilia Forest, near Morondava, *Perrier de la Bâthie* 8874 (P); Belo, Tsiribihina R., *Decary* 15538 (P); km 5 Miandrivazo-Mandoto Road, *Rakotozafy* 1709 (TAN); Miandrivazo District, Dabolava, *Decary* 15233 (K, P, type of *P. lanceolata*). Sin. loc.: *Baron* 258 (K, P), 1177 (K, P), 2501 (K, P), 2929 (K, P), 4022 (K), 4764 (K, P).

Notes. The leaves of the type of *Plectaneia thouarsii* have rather inconspicuous venation as those of the type of *P. breviloba*. Leaves of the types of *P. boivinii* and *P. lanceolata* have conspicuous venation, while in this respect the type of *P. macrocarpa* and the specimens *Leeuwenberg* 14198 and *Schatz & Modeste* 3097 are intermediate. The smallest leaves are in the types of *P. microphylla* (1–2 cm long) and *P. breviloba* (1–3 cm long) and the largest in the types of *P. boivinii* (4–8.5 cm long) and *P. lanceolata* (4–8 cm long). The greatest variation in leaf sizes has been observed in *Leeuwenberg* 14204 (2–4.7 cm long). The flowers of the above cited specimens and those placed under these names by Markgraf are remarkably uniform in most characters.

The sepals are acute or obtuse, pubescent or glabrous outside. They are united at the base for 0.2–1 mm, which is 0.1–0.67 of their length. Up to the present specimens with sepals pubescent, connate at the base for only about 0.2 mm and acute or obtuse were named *P. isalensis*, those with sepals united for 0.1 of their length, glabrous and mostly acute *P. elastica* var. *inutilis* and those with sepals united for 0.33–0.67 of their length, pubescent or glabrous and mostly obtuse *P. thouarsii*. As several specimens are intermediate, e.g. *Perrier de la Bâthie* 11311 with sepals pubescent, united

for 0.2—0.4 of their length and obtuse, and *Humbert* 18965 with sepals glabrous, united for 0.2—0.5 of their length and acute or obtuse, it was not possible to keep up *P. elastica* var. *inutilis* and *P. isalensis* as separate taxa. Preceding authors also had problems to name the latter species. Markgraf named it as *P. thouarsii* and Pichon considered it as intermediate between *P. elastica* and *P. thouarsii*. When collecting in southern Madagascar the author supposed that *P. firingalavensis* could be maintained as a distinct species, but after analysis of all material it turned out to grade into the variable *P. thouarsii*.

Flowering specimens with corolla lobes glabrous outside and at least twice as long as the tube were identified as *P. hildebrandtii*, although the type specimen of this name is fruiting and cannot be distinguished from fruiting specimens of *P. thouarsii* to which were assigned only specimens with corollas at least partly hairy outside. Some specimens are intermediate in the characters of the corolla, e.g. *Perrier de la Bâthie* 16559, the lectotype of *P. isalensis* has corolla lobes 1.5 x as long as the tube which are glabrous or nearly so outside. In *Afzelius* 10 Sept. 1912 the corolla is glabrous outside and the lobes vary from 1.5 to 2 x as long as the tube. The corolla is hairy outside and the lobes are 2—2.5 x as long as wide in *Pervillé* 440 and *Richard* 269.

The leaves are usually glabrous, but in some specimens they are pubescent, especially beneath, e.g. in *Perrier de la Bâthie* 18749, the type of *P. inutilis* var. *hirsuta* and partly pubescent, especially on the costa in *Perrier de la Bâthie* 8939, the type of *P. rhomboidalis*.

6. *Stephanostegia* Baill. in Bull. Mens. Soc. Linn. Paris 1: 748 (1888); Markgraf, Fl. Mad. fam. 169: 102 (1976). — Type species: *S. hildebrandtii* Baill.

Trees 4—25 m high, with white latex. Trunk up to 70 cm in diameter. Branches lenticellate; branchlets terete, glabrous. *Leaves* opposite, petiolate; petiole glabrous; blade coriaceous even when fresh, entire, glabrous on both sides, with numerous often obscure secondary veins, anastomosing into a submarginal veins, forming an angle of 60—80° with the costa; tertiary venation reticulate and inconspicuous or invisible. *Inflorescence* terminal and in the axils of the upper leaves, many-flowered, lax, except for the the large branchings. Peduncle glabrous or pubescent; pedicels pubescent.

Lower bracts leafy, other sepal-like and like bracteoles about as long as the sepals. *Flowers*: *Sepals* connate at the base, subequal, ovate, broadly ovate or suborbicular, obtuse or rounded, pubescent to almost entirely glabrous outside, ciliate, glabrous or nearly so inside, without colleters. *Corolla* white or lilac, with an ovoid or subglobose head in the mature bud about one third of the bud length, puberulous to almost entirely glabrous outside, basal part enclosed in the calyx always glabrous, ciliate around lobes, pubescent inside at the base of the lobes and on the callous ring at the mouth; tube amply cylindrical to obconical, mostly widened around the anthers which are placed in the upper half, with 5 longitudinal slits alternating with the lobes; lobes overlapping to the left in bud, obliquely elliptic, ciliate, entire, spreading. *Stamens* with apex about 0.5 mm below mouth of corolla tube; filaments very short, glabrous; anthers ovate or nearly so, obtuse at the apex, cordate at the base, entirely fertile, glabrous. *Pistil* with apex about halfway along anthers; ovary subglobose, abruptly narrowed into the short style, of 2 separate carpels; pistil head of a basal globe or cylinder about 0.3—0.4 x 0.3—0.4 mm and an oblong (when lobes not diverging) bilobed stigmatic apex about 0.7 x 0.2 mm. *Fruit* of 2 separate follicles forming various angles with each other even within a single branch; follicles ellipsoid, woody, adaxially dehiscent. *Seed* light brown, with grain slightly darker, elliptic, flat, winged all around, striate or punctate, with a linear hilum in the middle; endosperm thin, mealy; embryo straight, spatulate; cotyledons ovate, rounded at the apex and at the base; rootlet mostly slightly longer than cotyledons.

Distribution: Two species endemic to Madagascar.

The genus *Stephanostegia* strikingly resembles the New World genus *Aspidosperma* by the leaves, inflorescences, flowers and the wings of the seeds. Both genera are distinguished mainly as follows:

Leaves always opposite; follicles ellipsoid, not laterally compressed; seeds small, up to 16 mm long; corolla tube with longitudinal slits.....	Stephanostegia
Leaves mostly alternate; follicles elliptic or nearly so, usually laterally compressed; seeds much larger; corolla tube without slits....	Aspidosperma

Key to the species of *Stephanostegia*

1. Corolla white; leaves mostly acuminate; follicles mostly acuminate. Western Madagascar.....2. ***S. hildebrandtii***
Corolla lilac; leaves mostly obtuse or rounded; follicles obtuse.
Eastern Madagascar.....1. ***S. capuronii***

6. 1. *Stephanostegia capuronii* Markgr. in *Adansonia* II, 12: 219 (1972), as *capuroni*; Fl. Mad. fam. 169: 108, pl. 15, 1—5, map 23 (1976). — Type: Madagascar, Antsiranana, Andrakadraka Forest, near Antalaha, *Capuron* SF 24636 (holotype P; isotypes B, BR, G, K, TEF, WAG, Z). Fig. 16, p. 98; map 14, p. 88

Heterotypic synonym: *S. brevis* Markgr. in op. cit. 220; op. cit. 111, pl. 15, 6—9, map 23, **syn. nov.** — Type: Madagascar, Toamasina, Ambila-Lemaitso, SF 31-R-196 (holotype P).

Tree 5—20 m high. Trunk 5—60 cm in diameter; bark dark brown, rough and longitudinally fissured or smooth in young trees, with white latex. *Leaves*: petiole 1—5 mm long; blade elliptic, ovate or narrowly so, 1.5—3 x as long as wide, 3—15 x 1—7 cm, rounded to shortly acuminate and with a blunt acumen at the apex, cuneate or rounded at the base. *Inflorescence* 2—9 x 2—7 cm. Peduncle 10—45 mm long; pedicels 0.5—3 mm long. *Flowers*: *Sepals* pink-magenta, 1—2 x as long as wide, 1.5—2.5 x 1—1.5 mm. *Corolla* lilac, lobes sometimes(?) maroon, with an ovoid head in the mature bud, puberulous outside, with a pubescent belt below the insertion of the stamen 1 mm wide; tube 1.8—3 x as long as the calyx, 1—2 x as long as the lobes, 3—4 mm long, 1—1.5 mm wide at the base, 1—2 mm wide at the throat; lobes elliptic, 0.5—1 x as long as the tube, 1.5—2 x as long as wide, 1.5—4 x 1—2.5 mm, rounded or obtuse. *Stamens* with apex about 0.5 mm below mouth of corolla tube, inserted 0.5—0.7 of the length of the corolla tube; anthers 1.2 x 0.5 mm. *Pistil*: ovary 0.7 x 0.7 x 0.7 mm, glabrous. *Fruit*: follicles 2—3.5 x 1—1.5 cm, obtuse, roughly lumpy or smooth. *Seed* 12—16 x 6—8 mm; grain 3—4 x 2 mm.

Distribution: Endemic to Eastern Madagascar.

Ecology: Wet forest at low altitude.

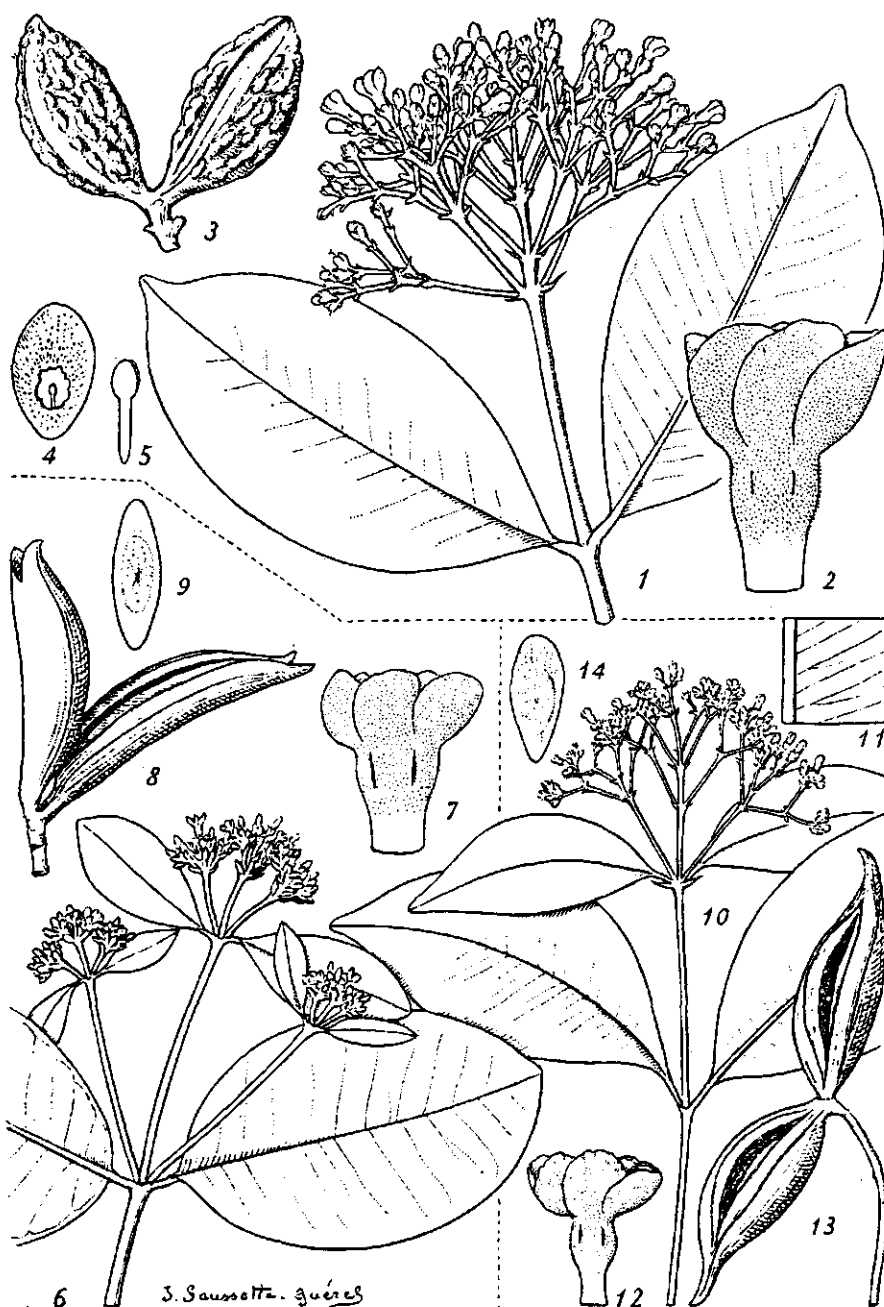


Fig. 16. 1-9. *Stephanostegia capuronii*. 1 & 6, habit (x 2/3); 2 & 7, corolla with longitudinal slits (x 4); 3 & 8, fruits (x 2/3); 4 & 9, seeds (x 1); 5, embryo (x 5). 10-14. *S. hildebrandtii*. 10, habit (x 2/3); 11, part of leaf blade much enlarged; 12, corolla (x 4); 13, fruit (x 2/3); 14, seed (x 1). 1-2 from Capuron SF 24636; 3-5 from SF 16103; 6-7 from SF 15698; 8-9 from Capuron SF 9091; 10-12 from Baron 5451; 13-14 from Boiteau 6174.

Geographical selection of the approximately 30 specimens examined:

Madagascar. Antsiranana: road from Sambava to Antsiranana-Nord, *Capuron* SF 27219 (P, TEF, paratype of *S. brevis*); Andrakadraka Forest, near Antalaha, *Capuron* SF 24636 (B, BR, G, HBG, K, P, TEF, WAG, Z, type); S of Antalaha, *Capuron* SF 27787 (P, TEF, WAG, paratype). Toamasina: Sahajinja, Maroantsetra District, RN (?) 2091 (P); Sarsoala Peninsula, *Schatz et al.* 1921 (BR, C, K, P, TAN, WAG); Manonga R. basin, tributary Rantabe R., *Capuron* SF 9091 (G, K, P, TEF, WAG, paratype of *S. b.*); Tampolo Forest, *Leeuwenberg* 13747 (WAG), 13748 (BR, P, TAN, WAG); *ibid.*, SF 15616 (K, P, WAG, paratype, also paratype of *S. b.*), 15698 (K, P, TEF, WAG, paratype, also paratype of *S. b.*), 468-R-107 (P, TEF); *ibid.*, *Capuron* SF 16103 (P, TEF, paratype); 3.5 km N of Foulpointe, *Noyes et al.* 956 (BR, P, WAG); Analalava Forest, W of Foulpointe, *Leeuwenberg* 13763 (WAG), 14476 (BR, P, TAN, WAG); Antetazana, SF 4495 (P, TEF, paratype); Andriantantely, Lohandava, Brickaville, SF 735-R-162 (P); Ambila-Lemaitso, SF 3205 (P, TAN, TEF, paratype of *S. b.*), 7570 (P, TEF, paratype of *S. b.*), 8286 (P, TEF, WAG, paratype of *S. b.*), 8291 (P, TEF, WAG, paratype of *S. b.*), 8316 (P, TEF, WAG, paratype), 12254 (K, P, TEF, WAG, paratype of *S. b.*), 12255 (P, TEF, WAG, paratype), 13292 (P, TEF, paratype), 31-R-196 (P, type of *S. b.*). Fianarantsoa: Farafangana, Marofamahy, SF 16193 (P, TEF, WAG, paratype of *S. b.*), 16195 (P, TEF, WAG, paratype of *S. b.*); Manombo, SF 45-R-62 (P, TEF). Toliara: Tsingafyfy Forest, between Manambato and Fitamalama Rs., *Capuron* SF 28677 (G, K, P, TEF, WAG, paratype of *S. b.*)

Note. The only character on which *S. brevis* could be distinguished from *S. capuronii* is the surface of the fruit, smooth in the first and roughly lumpy in the second. Both forms have been collected in the same forest near Ambila-Lemaitso and the character varies greatly also in the second species of the genus.

6. 2. *Stephanostegia hildebrandtii* Baill. in Bull. Mens. Soc. Linn. Paris 1: 748 (1888); Markgraf, Fl. Mad. fam. 169: 110, pl. 15, 10–14, map 23 (1976). — Type: Madagascar, Mahajanga, Vavatohe, *Hildebrandt* 3330 (holotype P; isotypes G, K, L, M, W, Z). Fig. 16, p. 98; map 14, p. 88

Heterotypic synonyms: *Rauwolfia celastrifolia* Bak. in Journ. Linn. Soc. 25: 335 (1890), as *Rauwolfia*. — Type: Madagascar, Mahajanga, Androna, *Baron* 5451 (holotype K; isotype P).

S. parvifolia Pichon in Not. Syst. ed. Humbert 13: 206 (1948).

S. holophaea var. *parvifolia* (Pichon) Mgf. in *Adansonia* II, 12: 221 (1972); op. cit. 108, pl. 14, 7–12, map 22, **syn. nov.**

— Type: Madagascar, Antsiranana, Analamera Hills, *Humbert* 19222 (holotype P; isotypes G, K, TAN).

S. holophaea Pichon, l.c.; Markgraf, op. cit. 106, pl. 14, 1–6, map

22, **syn. nov.** — Type: Madagascar, Antsiranana, Diego-Suarez, *Ursch* 272 (holotype P).

S. megalocarpa Markgr. in op. cit. 220; op cit. 104, pl. 14, 13—17, map 22, **syn. nov.** — Type: Madagascar, Antsiranana, Nosy Be, Lokobe Reserve, *Capuron* SF 11414 holotype P; isotype TEF).

Tree 4—25 m high. Trunk up to 70 cm in diameter; bark brownish; wood hard, yellow. Branches pale or dark brown. *Leaves*: petiole 2—12 mm long; blade elliptic, (1.5—)2—4 x as long as wide, (2—)4—11.5 x (0.7—)1—6 cm, acuminate to obtuse at the apex, cuneate at the base. *Inflorescence* 4—10 x 4—10 cm. Peduncle 20—40 cm long; pedicels 0.5—2 mm long. *Flowers*: *Sepals* greenish-white or yellowish-green. *Corolla* white, with a subglobose head in the mature bud, villose behind the anthers, pubescent belt below the insertion of the stamens 0.5 mm wide with straight hairs directed downwards; tube 2—2.5 x as long as the calyx, 1—2 x as long as the lobes, 2—3 mm long, 1—1.3 mm wide at the base, 1.5—1.8 mm wide around the anthers, contracted at the mouth; lobes falcate, 0.4—1 x as long as the tube, 1—1.3 x as long as wide, obtuse. *Stamens* inserted 0.5—0.7 of the length of the corolla tube (at 1—2 mm from the base); filaments 0.3 mm long, glabrous; anthers yellow or orange, 0.6—0.7 x 0.3 mm. *Pistil*: ovary 1 x 1 x 1 mm, puberulous or glabrous. *Fruit*: follicles dark brown, obliquely ellipsoid, 2.5—4 x 0.7—1.5 x 0.7—1.5 cm, acuminate or almost obtuse, smooth or lumpy, puberulous to glabrous. *Seed* 8—21 x 4—7 mm; grain 5—7 x 2—3 mm.

Distribution: Endemic to western Madagascar.

Ecology: Dry forest. Alt. low, up to 400 m.

Geographical selection of the approximately 35 specimens examined:

Madagascar. Antsiranana: Diego-Suarez, *Ursch* 272 (P, type of *S. holophaea*); Mt d'Ambre, *Capuron* SF 20079 (K, P, TEF, WAG); Andrafiarena and upper Rodo Rs. confluence, *Capuron* SF 24551 (K, P, TEF, WAG); Ankarana Hills, *Humbert & Cours* 32676 (P), 32764 (K, P, WAG); *ibid.*, *Capuron* SF 3040 (K, P, TEF, WAG); Analamera Hills, *Humbert* 19136 (P), 19222 (G, K, P, TAN, type of *S. parvifolia*); Mt Ambohipiraka, NE of Ambilobe, *Humbert & Cours* 5669 (P), 32851 (P, WAG), 32894 (K, P, WAG); Nosy Be, Lokobe Reserve, *Capuron* SF 11414 (P, TEF, type of *S. megalocarpa*); Mt Ambohibe, *Cours* 5678 (P); NW of Ampondrabe, *Gachet* SF 5 bis (P, TEF); Sambirano, *Perrier de la Bâthie* 15463 (P); Ampondrabe-Ambaliha Hills, N of Ambanja, *Capuron* SF 11388 (P, TEF, WAG). Mahajanga: Moramandia, *Decary* 1250 (P, WAG), 1372 (P); Vavatohe, *Hildebrandt* 3330 (G, K, L, M, P, W, Z,

type); crossing of Antsohihy and Analalava Roads, *Capuron* SF 18880 (P, TEF); W of Antonibe Peninsula, *Capuron* SF 18551 (P, TEF, WAG); Berivota Plateau, SE of Mahajanga, *Capuron* SF 18457 (K, P, TEF); Amborovy, N of Mahajanga, *Capuron* SF 11988 (K, P, TEF, WAG); Namoroka Reserve, *Rakotovao* RN 3900 (P, TAN); *ibid.*, SF 5 (K, P, TAN, US); Belambo, near Maevatanana, *Perrier de la Bâthie* 944 (BM, P), 14654 (P); Nandrojia, SF 12408 (P, WAG); Ankara, *Capuron* SF 9394 (P, TEF, WAG), SF 10427 (P, TEF, WAG); Kelifely Mts, *Morat* 4730 (P, TAN, WAG); Ambatomitsangana, SF 8162 (P, TEF); Antsalova, *Dokobe* RN 11062 (P); near Ambodiriana, *Leandri* 2341 (K, P, WAG); Bemaraha Mts base, *Boiteau* in Herb. Jard. Bot. Tana. 6174 (P, WAG); Antsalova-Tsiandro Road, *Capuron* SF 6916 (K, P, TEF, WAG), 18031 (P, TEF). Toliara: Analamitsiva, Miandrivazo, SF 13500 (K, P, TEF, WAG); Angodongodona, 5 km E of Miandrivazo, SF 7-R-243 (P). Sin. loc.: *Baron* 5451 (K, P, type of *Rauvolfia celastrifolia*).

Note. The indumentum on the sepals, on the corolla outside and on the ovary varies more or less gradually and independently. The fruits of the type of *S. megalocarpa* are somewhat larger than those of the other specimens seen, but the leaves are perfectly similar to those of the type of *S. hildebrandtii*. Therefore *S. hildebrandtii* was assigned some new synonyms.

A new name to replace a homonym

Carissa pichoniana Leeuwenberg, **nom. nov.** — Type: Madagascar, Toamasina, Manampotsy R., SW of Vatoman-dry, *Perrier de la Bâthie* 14110 (holotype P).

Basionym: *C. vertillata* Pichon in Mém. Inst. Sc. Madag. ser. B, 2: 126, 136 (1949); non Sessé & Mocino, *Plantae Novae Hispaniae* 29 (1887) which is a synonym of *Alstonia longifolia* (A. DC.) Pichon.

Correction of author's error

Lamarck's *Tableau Encyclopedique* cited in Leeuwenberg, *Tabernaemontana* 1, *The Old World Species* (1991, pages 169 and 204) was wrongly cited. He supposed to cite Vol. 1, part 2, but it was Vol. 2, part 6, which came out in 1819 and not in 1792. Taxa published there have been published even earlier by Poiret in Lamarck, *Enc.* respectively 7: 529 (1806), *Tabernaemontana pandacacui* and Suppl. 5: 276 (1817); *T. populifolia* Poir. published on the same page as *T. pandacacui*, was already known as *Exacum*

vaginale Labill., Nov. Holl. Pl. Sp. 1: 37, pl. 51 (1805) = *Logania vaginalis* (Labill.) F. v. Muell. Therefore the combination *Logania populifolia* (Poir.) Leeuwenberg resulted in an additional synonym for *Logania vaginalis*.

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Index of exsiccatae of collections made in Madagascar and the Comoro Islands

Craspidospermum verticillatum (Cv), *Gonioma malagasy* (Gm), *Mascarenhasia arborescens* (Ma), *M. havetii* (Mh), *M. lanceolata* (Mla), *M. lisianthiflora* (Ml), *M. macrosiphon* (Mm), *M. rubra* (mr), *M. speciosa* (Ms), *M. tampinensis* (Mt), *Petchia cryptophlebia* (Pec), *P. erythrocarpa* (Pee), *P. humbertii* (Peh), *P. mada-gascariensis* (Pem), *P. montana* (Pemo), *P. plectaneifolia* (Pep), *Plectaneia longisepala* (Pll), *P. stenophylla* (pls), *P. thouarsii* (Plt), *Stephanostegia capuronii* (Sc), *S. hildebrandtii* (Sh).

Only numbered specimens have been listed. Here the names of the collectors of the series "Reserves naturelles" (= RN), and of "Service forestier" (= SF) have not been mentioned as these series are continuous and the collector names often have been omitted.

Allorge, L., 549, 578, 594 (Ml), 596, 960 (Plt), 961, 962 (Pem).

Adrianarisata, M., 12 (Ma).

Antilahimena, P., 62 (Sh), 80 (Pee), 138 (Plt).

Armand, W., 85 (Ml).

Barnett, L., 144 (Pec), 481 (Plt).

Baron, R., 89 (Cv), 92 (Ml), 111 (Cv), 258 (Plt), 654 (Pee), 768 (Cv), 853 (Cv and Pec, now 853a), 1177 (Plt), 1790 (Pec), 2458 (Pemo), 2501 (Plt), 2525 (Pee), 2929 (Plt), 3234 (Pec), 3242 (Ma), 3840 (Mm), 4022 (Plt), 4551 (Pee), 4562, 4575 (Ml), 4663 (Pee), 4716 (Ml), 4764 (Plt), 4888 (Pee), 5000 (Pemo), 5451 (Sh), 5747 (Ma), 5765 (Pec), 5767 (Ma), 5787 (Ml), 5840 (Mla), 5916 (Pee), 6018 (Pec), 6084 (Pee), 6157 (Ma), 6370 (Mla), 6433 (Ma), 6541 (Pee), 6769, 6869, 6874 (Ml).

Beaujard, Ph., 18 (Pem), 257 (Pee), 259, 260 (Pem), 261 (Plt).

Benoist, R., 788 (Pem).

Bernardi, L., 11144 (Ml), 11680 (Pee), 11763 (Ma), 11820 (Plt), 11843 (Mla), 11869 (Ma), 11903 (Plt).

Bernier, 106 (Pem), 169, 285, 287 (Ma).

Birkinshaw, C., 60 (Pee).

Boiteau, P., 85 C (Cv), 117 D (Ma), 358 (Ml), 373, 373 B (Pls), 493 (Plt), 504 (Sc), 1009 (Pee), 1011 (Ma), 1013 (Ml), 1030 (Plt), 1054, 1092 (Ml), 2007, 2019 (Pee), 2064, 2102 (Plt), 2116 (Pem), 2119, 2122, 2123 (Pee), 2125 (Pep), 2132 bis (Cv), 2155, 2220 (Plt), 2340 (Ma), 2545, 2546 (Pem), 2577 (Pee), 2610 (Pem), 3005 (Plt), 3022, 3026, 3029 (Pee), 3056 (Ms), 3076 (Plt).

Boivin, B., 13, 17 (Plt), 1786 (Ma), 2075 (Pee), 2459 (Mla), 2460, 2461 (Ma), 2463 (Plt), 3202 (Pee).

Bosser, J., 1050, 1716 (Ml), 1849, 3267, 3521, 3527, 4591, 4689, 4731 (Ml), 5714 (Pee), 5724, 5725, 5841, 5923, 6692 (Ma), 7874 (Pee), 7889 (Plt), 8100 (Ml), 8438 (Ma), 8440 (Ml), 8457, 8458 (Plt), 8909 (Ma), 9170 (Pls), 9171 (Plt), 9186 (Ml), 9692 (Cv), 10255, 10417 (Plt), 10654, 12452 (Cv), 13226 (Plt), 13232, 13241 (Mla), 13803 (Cv), 13862 (Ml), 13872, 13884 (Plt), 13947, 13976, 13981 (Ml), 13982 (Plt), 14126 (Cv), 14173, 14400 (Plt), 14438 (Ml), 14840 (Ms), 15747 (Ml), 15811 (Plt), 15840 (Ms), 16259 (Plt), 16663, 16669 (Ml), 17320 (Plt), 17359 (Pls), 17404 (Ml), 18574 (Pem), 19091, 19109 (Ma).

Broin, A., 138, 139 (Pee), 140 (Pem), 146 bis (Pee).

Catat, L.D.M., 1114, 4348 (MI).

Chapelier, L.A., 93 (Ma).

Chauvet, 96, 431 (Plt).

Cloisel, J., 66 (Ms), 70 (Pem), 79 (Ms), 80 (Pem), 132 (Ma).

Cours, G., 871 (Ma), 1517 (Cv), 1580 (Plt), 1725 (Pem), 1860 (Ma), 1991 (Plt), 2009 (Cv), 2012 (Plt), 2014 (Ma), 2015, 2016 (Cv), 2022 (Plt), 2026 (Ma), 2104 (Plt), 2264 (Ma), 2789, 2968 (Pem), 3103 (Ma), 3231, 3257, 3881 (Pee), 3954, 3975 (Ma), 3988 (MI), 4276 (Plt), 4860 (Ma), 4887, 4938 (Pem), 5024 (MI), 5100 (Ma), 5437, 5448 (Pee), 5647 (Mla), 5669, 5678 (Sh).

Cremers, G., 1282 (Cv), 1334 (Pee), 2850 (MI), 2914 (Ma), 2926 (Cv), 3603 (Pem), 3648 (Plt).

Croat, T.B., 29465 (Plt), 30302 (Cv), 30348 (MI), 30361 (Cv), 30364 (MI), 30617 (MI), 30672 (Plt), 31029, 31499 (Pls), 31597, 31671 (Plt), 31710 (MI), 31732 (Plt), 31753, 31755 (Ma), 32085 (MI).

Daniels, P.S., 57 (Ma).

D'Arcy, W.G., 15367 (Pem).

Debray, M., 51 (Cv), 404 (Ma), 533 (Pee), 781 (Pem), 841 (MI), 1210 (Mla), 1244 (Pem), 1249 (Pee), 1251 (Pem), 1253 (Ma), 1255 (Pem), 1256 (Pee), 1269 (Pem), 1512 (Pee), 1537, 1539 (Ma), 1553 (Mla), 1557 (Pee), 1562 (Ma), 1586 (Mla), 1588, 1627, 1672 (Pee), 1725 (Pem), 1732 (Ms), 1752, 1755, 1802 (Pem), 1807 (Ma), 1819 (Pem), 1864 (Sc), 2016 (Cv).

Decary, R., 62 (Ma), 923, 957, 972 (Mla), 1052, 1065, 1157, 1160 (Ma), 1202 (MI), 1245 (Ma), 1250 (Sh), 1254, 1258 (Plt), 1285 (Ma), 1326 (Mla), 1372 (Sh), 2089 (Plt), 2233, 2274 (Pee), 2288 (MI), 2296 (Pee), 2298, 2318, 2326, 2329, 2334 (MI), 2360 (Pee), 2440 (MI), 2700 (Pls), 2824 (MI), 2933 (Pls), 3323 (MI), 3512, 3518 (Pls), 4056 (Plt), 4105 (MI), 4166 (Ms), 4172 (Plt), 4312, 4319 (MI), 4569 (Plt), 4855 (Pee), 4967, 5312, 5331 (Pem), 5387 (Pep), 5407, 5418, 5421 (Pem), 5438, 5477 (Pep), 5527, 5535 (Pem), 5551 (Ma), 5792, 5819 (Pem), 6015 (Cv), 6379 (Plt), 6547 (Plt), 6977 (Cv), 7390 (Pee), 7551 (Plt), 7756 (Pee), 7774, 7800 (MI), 8125 (Pee), 8188, 8249 (MI), 8257 (Ma), 8244 (Pee), 8260 (MI), 8262 (Pee), 8264, 8273 (MI), 8498, 8586 (Pls), 8868 (Plt), 9098 (Pls), 9407 (Ma), 9430 (MI), 9556 (Pls), 9768 (Pem), 9776 (Ma), 9909 (Pem), 9977 (Plt), 10396, 10502, 10578, 10599, 10615, 10635 (Pem), 10820, 10836, 10845 (Ma), 10996 (Cv), 11057 (Pem), 11079 (Ma), 12809, 12811 (MI), 12834, 12878, 12884 (Pee), 12888, 13132, 13292 (Plt), 14099 (MI), 14101 (Plt), 14290, 14298 (Ma), 14395, 14440 (Pee), 14467 (Plt), 14471 (Pee), 14537 (Ma), 14543 (Plt), 14553 (Ma), 14561 (Mla), 14612 (Plt), 14777, 14780, 14787 (Mla), 14884 (Plt), 14898 (Ma), 15194 (Pee), 15223 (MI), 15233 (Plt), 15257, 15274, 15277 (MI), 15384 (Ma), 15403, 15538 (Plt), 15570, 15580 (MI), 15620, 15641, 15651 (Pee), 15660, 15901 (MI), 15746 (Plt), 15924 (MI), 15964 (Pls), 16275, 16324, 16337 (MI), 16466 (Plt), 17049 (Pee), 18739 (Plt), 18883 (Pls), 18889, 18890 (MI), 18892 (Pls), 18951 (MI).

Dequaire, J., 10098 (Ma), 10116 (Pee), 24079 (MI), 24195, 24247, 24255 (Pls), 27641, 27644, 27670 (Ma).

Derleth, P., 65 (Pem), 141 (Ma), 152 (Pee).

Deroin, T., 127 (Pem), 165 (Pee), 189 (Mla).

Descoings, B., 103 (Ma), 256, 271 (Plt), 306 (Pem), 335 (Ma), 1254, 1295, 1408 (Plt), 1670 (MI), 1922 (Plt), 1923 (Mla), 2196 (MI), 3302 (MI), 3364 (Ma),

3365 (Plt), 3370 (Pee), 3379 (Ma), 3527 (Pee), 3563, 3636 (MI), 3708, 3733 (Plt).

Dorr, L.J., 2956 (Plt), 3170 (Cv), 3318 (Plt), 3490 (Cv), 3591 (Pee), 3749 (MI), 3778 (Pee), 3827 (Plt), 3926 (MI), 4016, 4021 (Pem), 4181 (MI).

Doutrelepont, H., 1235 (Pee).

Dumetz, N., 504 (Ma), 564 (Plt), 585 (Ms), 735, 739 (Pem), 1201, 1351 (Ms), 1366 (Pee), 1401 (Ma).

Du Puy, B. MB 42, 406, 2446 (MI).

Edouard, P., 29 (Ma).

Evrard, C., 11234 (Pec), 11258 (Plt).

Exposition coloniale de Marseille, 19 (Plt).

Exposition permanente de Madagascar, 176 (MI).

Faber-Langendoen, D., 2984 (Ma).

Floret, J.J., 1091, 1092, 1106 (Pee), 1232 (Ma).

Fosberg, F.R., 52400 (MI), 52546 (Ma).

Forsyth-Major, C.J., 132 (Ma), 324 (Pec), 331 (Ma).

Friedmann, F., 331, 481 (Ma).

Garnier, 145 (Pec).

Gautier, L., 2392 (Ma), 2456 (Pem), 2588 (Plt), 2629, 2638 (Ma).

Geay, F., 5983, 5984, 5985, 6003, 6004, 6005, 6006, 6007, 6011, 6012, 6014, 6015, 6345, 6379, 6380, 6383 (MI), 6393, 6676, 6677, 6679, 6680, 6681, 6682, 6683, 6684, 6685, 6686, 6713, 6714, 6738 (Ma), 6748 (Ms), 6749 (Plt), 6755 (MI), 6774 (Plt), 6780 (Pem), 7043, 7044 (Plt), 7254 (Ma), 7722 (Pee), 7744 (Ma), 7898, 7899, 7902, 7905 (Plt), 7929, 7930, 7931, 7932 (Ma), 8146, 8147 (Plt).

Geldermalsen-de Jongh, van, 82/8 (Ms).

Gentry, A., 11356 (Ma), 11370 (Plt), 11458 (Pee), 11544, 11739 (Plt), 11794 (Pee), 11799 (MI), 11872, 11894 (Mla), 11906 (Plt), 11922 (Pee).

Gereau, R.E., 3253 (Pem), 3298 (Ma), 3313 (Ms).

Gerold, R., 12 (Pem).

Grevé, 29 (Plt), 41, 100, 204 (MI).

Guillaumet, J.-L., 3853 (Ma), 4218 (Pee).

Guillot, J., 7 (Ma), 45 (Plt).

Harder, D.K., 1588 (Pee), 1603, 1713 (Ma), 1758, 1765 (Plt).

Hildebrandt, J.M., 2949 (Pee), 3012 (Plt), 3078 (Ma), 3099 (MI), 3232 (Pee), 3299 (Mla), 3330 (Sh), 3602 (Cv), 3679 (Pec), 3936 (Cv).

Hodgkin, H.T., 65 (Cv).

Homolle, A.-M., 45 (Pee), 130 (Ma), 161 (Pee), 171 (Ma), 174 (Pee), 391 (Plt), 1542 (MI), 1735 (Pem), 2009 (Cv), 2014 (Ma), 2016 (Cv), 2104 (Plt), 2264 (Ma).

Humbert, H., 2033, 2034 (Plt), 2085 (Ma), 2132, 2356, 2391 (Plt), 2733, 2745 (MI), 2790 (Pls), 2873 (MI), 3127, 3135 (Plt), 3191 (Pemo), 3430 (Ma), 3592 (Plt), 3614 (Pemo), 3989 (Pee), 4028, 4038 (MI), 4064, 4065, 4084, 4372 (Ma), 4921 (Plt), 4926 (MI), 4927 (Plt), 5013 (MI), 5090, 5257, 5627 (Pls), 5669 (Sh), 5717 (Ma), 5774 (Pem), 5800 (Ma), 5804 (Ms), 5939, 6052 (Ma), 6200 (Pemo), 6238, 6251 a (Ma), 6488 (MI), 6747 (Plt), 7024 (Cv), 7050 (MI), 7068 bis (Plt), 11367 bis (MI), 11550 (Plt), 11651 (MI), 11670, 11735 (Plt), 11837 (Pep), 12195 (Ma), 12333 (MI), 12751, 12945 (Pls), 13346,

13399 bis (Plt), 13764, 13882, 13907 (Cv), 13968 (Ma), 14435 (MI), 18073 (Pee), 18694 (Mla), 18741 (Pee), 18773, 18774 (Mla), 18775, 18842 (Ma), 18870, 18871, 18876, 18877 (Mla), 18965, 18996 (Plt), 19025 (Ma), 19043 (Mla), 19085 (Ma), 19136 (Sh), 19195 (Mla), 19222 (Sh), 19385 (MI), 19517 (Ma), 19539, 19579 (MI), 19646, 20025 (Plt), 20354 (Ms), 20410 (Pem), 20421 (Plt), 20435 (Ms), 20575 (Cv), 20611 (Ms), 20679 (Cv), 20740, 20759 (Pem), 20787 (Plt), 22023 (Pee), 22595 (Peh), 23205 (Ma), 23514 (Peh), 24455 (Ma), 24584 (Pee), 28661, 28708 (MI), 28941 (Plt), 29587 (Gm), 29835, 30018 (MI), 31973 (Ma), 32094, 32387 (Pee), 32411 (Plt), 32570, 32675 (Pee), 32676, 32764, 32851 (Sh), 32865 (Mla), 32894 (Sh), 32910 (Pee).

Humblot, L, 26 (Pee), 58, 88 (Pem), 204 (MI), 611 (Cv), 657 (Pem), 1026 (Pee).

Imbert, T., 50 (Gm), 116 (Ma), 125, 127 (Pee).

Jacquemin, H., 253 (Pee), 275, 284, 287 (Ma), 311, 326 bis (MI), 479 (Mla), 528 (Ma), 535 (Mla), 556 (Ma), 753, 859 (Pee), 1163 (Pem), 1198 (Cv), 1202, 1203 (MI), 1205, 1229 (Pee).

Jongkind, C.C.H., 885 (Pemo).

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Phot. 2. *Mascarenhasia lanceolata*. Phot. and herb. Leeuwenberg (14260).

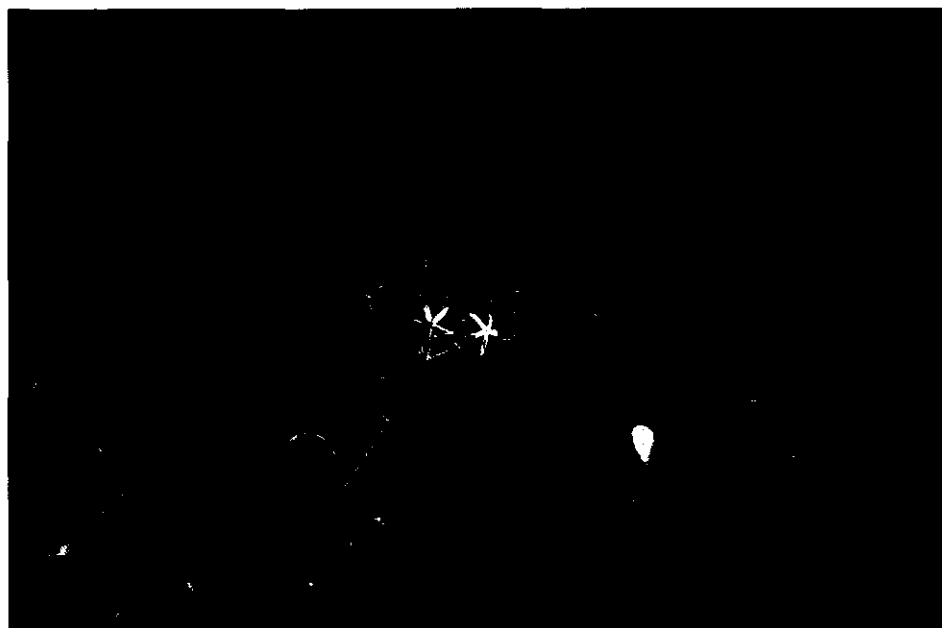


Phot. 3. *Mascarenhasia lisianthiflora*. Phot. and herb. Leeuwenberg (14685).

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Phot. 4. *Mascarenhasia lisianthiflora*. Phot. and herb. Leeuwenberg (14690).



Phot. 5. *Petchia madagascariensis*. Phot. and herb. Leeuwenberg (14203).

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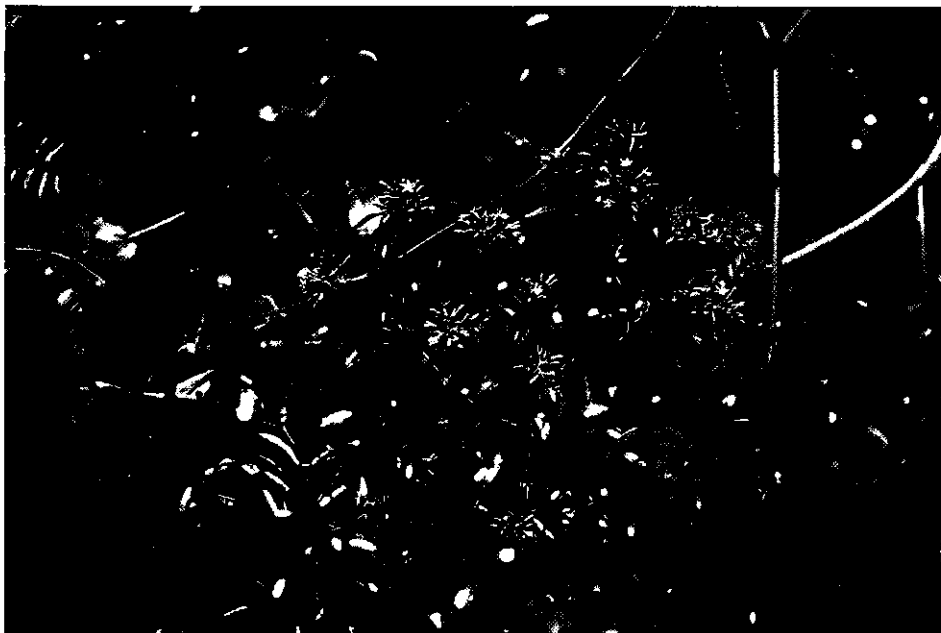


Phot. 6. *Petchia madagascariensis*. Phot. and herb. Leeuwenberg (14203).



Phot. 7. *Petchia madagascariensis*. Phot. and herb. Leeuwenberg (14188).

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Phot. 8. *Plectaneia thouarsii*. Phot. and herb. Leeuwenberg (14662).